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Peptic Ulcer Occurring During Cortisone Therapy: With Report of Cases

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In the past few years, since the advent of cortisone and A.C.T.H. as available therapeutic agents, many instances have been reported of their effects in a large variety of diseases. Along with reports of the effectiveness of one or other of these agents on the disease processes themselves, there have appeared also a number of publications dealing with "toxic" or "side" effects occurring because the doses used produced exaggerated physiological responses. One such complication of therapy is the development of peptic ulceration during and as a result of treatment.

That such ulcers could be of serious importance first became evident with the report of Beck, Browne et al. in May 1950.[1] They reported two cases of peritonitis occurring in patients treated with A.C.T.H. Their main concern in this publication was the fact that the usual signs and symptoms of peritonitis had been so masked that diagnosis had been difficult. Their second case was that of a 34 year old female, under treatment for periateritis nodosa, who perforated a duodenal ulcer on the seventh day of A.C.T.H. therapy, the dose being 100 mgm. daily in divided doses. The perforation was repaired surgically and convalescence was uneventful. This patient had had a previous history of dyspepsia which was said to have been due to a "nervous stomach" after a barium series had been reported as negative. She was continued post-operatively on smaller doses of A.C.T.H. without any difficulty.

In November 1950 Habif et al.[2] reported the case of a 54 year old male, under treatment for amyotrophic lateral sclerosis, who perforated a duodenal ulcer after 14 days on A.C.T.H., the dose being 20 mgm. four times daily. A previous course of A.C.T.H. of 15 days' duration had been given with no ill effect; there had been a rest of seven days between courses of treatment. The diagnosis in this case rested upon the radiographic finding of free air in the peritoneal cavity, and the subsequent demonstration at barium series of a deformed duodenal bulb with a 1.5 cm. crater. Recovery occurred without surgical intervention.

In February 1951, G. A. Smith[3] reported three cases in which ulcers, two duodenal and one gastric, were reactivated during A.C.T.H. therapy. The first perforated a duodenal ulcer within five days of starting A.C.T.H. and died two days later. Operation had not been performed due to difficulty or failure in making a diagnosis. In this case a duodenal ulcer had been known to exist: three hemorrhagic episodes had previously occurred, though there had been no symptoms for a period of some years before the final episode. The second case had also had a known history of duodenal ulcer with hemorrhages, and a gastro-enterostomy had been performed. This patient had been symptom free for some months prior to A.C.T.H. therapy, but while on it, bled again. The bleeding was controlled by medical management only, and the A.C.T.H. was continued on for some time without further adverse effect. The third case noted in this publication experienced a flare-up of symptoms from a gastric ulcer after only three days on A.C.T.H. and improved again when the hormone was stopped. However he later tolerated doses of cortisone up to 200 mgm. daily for twelve days with no ill effect.

Again in 1951, Rubin et al.[4] reported two cases of perforation of duodenal ulcers; the one within a matter of several days of starting A.C.T.H. therapy, and the other fifteen days after starting on cortisone. In neither instance was there a previous history of gastro-intestinal symptoms. During the next several years, further reports were published of peptic ulcer in relation to the use of A.C.T.H. or cortisone[5, 6, 7, 8, 9].

In 1951, Gray, Benson, Spiro, and Reifenstein[10] published their work on the effect of A.C.T.H and cortisone on the stomach. Subjects were treated with A.C.T.H. in doses of 100 to 160 mgm. daily. There was a marked increase in basal gastric secretion of hydrochloric acid (averaging 166%) and in total gastric secretion of HC1 (averaging 241%). The maximum rise did not occur in less than seven days. The effects on secretion of gastric pepsin were similar, its concentration rising to as high as 182% and its output per hour being increased up to 169% as compared to pre-treatment levels. In two of the seven cases so tested, no rise in pepsin occurred in spite of a rise in acid production. The actual volume of gastric juice was not altered.

These authors also treated a case of gastric ulcer with A.C.T.H. (25 mgm. q.i.d. for ten days). Definite evidence of impending perforation occurred. In this instance, the gastric pepsin concentration rose from 572-639 units per cc. to 1500 units per cc. HC1 output rose from 85 mgm. to 234 mgm. per hour. They also treated a case of

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healed duodenal ulcer with A.C.T.H. (30 mgm. for twenty-one days). In this case it is not possible to be certain that it was the A.C.T.H. that made the ulcer recur, although a large rise in gastric secretion of hydrochloric acid was noted.

Thus the mechanism by which ulcers could be produced or aggravated is evident in the great increase in gastric acidity and peptic activity which is occasioned by the use of these agents. However, variable and sometimes divergent findings are also reported.

Sandweiss et al, in 1950[11], evidently anticipating a beneficial effect, gave cortisone to two patients with chronic intractible duodenal ulcers, and another two were treated with A.C.T.H. One of the cortisone cases did not respond: he was made neither better nor worse. The other became symptom-free while on cortisone and nine months later was able to report continued well-being. One of the A.C.T.H. cases became worse, with increased pain and signs suggesting impending perforation. The other improved symptomatically while on treatment but relapsed again after it was stopped. These authors also mention a fifth case, one of gastric ulcer, in which A.C.T.H. was used. Perforation appeared imminent at the end of six days of treatment. It is interesting to see that two of the cases were apparently in some way improved.

An attempt at a controlled study in this regard was made by Forbes.[12] A series of eighteen patients with gastric ulcers was studied: five were treated with A.C.T.H. (though only three were finally reported); eight were treated with cortisone and seven used as controls. All were on a similar basic medical type of treatment. Of the three A.C.T.H. cases, one was definitely made worse; and two, while some symptomatic improvement occurred, failed to show radiographic evidence of healing of their ulcers. Of the eight cortisone cases, six showed clinical and radiographic improvement to the point of complete healing. The other two became symptom free but radiographic evidence indicated that their ulcers did not heal. The seven control cases behaved much like the cortisone-treated group; six showed clinical and radiographic evidence of complete healing while in the seventh, although improvement occurred, the ulcer failed to heal. This author was impressed with the delay in healing of gastric ulcers when A.C.T.H. was used, but since the cortisone treated group and the controls behaved so exactly alike, he felt that the deleterious effects of cortisone, if not negligible, were at least much less than those of A.C.T.H.

In this regard the following case histories may be of some interest.

Case 1

This 63 year old woman was admitted to the Winnipeg General Hospital on 22nd December 1954. She had been in good health until one year previously, when she fell, fracturing three ribs. Since this time she had, off and on, noticed some pain in the right shoulder; but only in the previous two months had it become at all severe. In this period of time she had noticed increasing difficulty in the use of the arm due to shoulder pain. For a slightly shorter length of time the left shoulder had been painful. She also noticed a less severe pain in the back and hips, radiating down to the knees. For about ten days to two weeks before admission, both shoulders, but especially the left, had been much more painful and because of the pain had become quite immobile. The left could scarcely be moved at all, though the right had retained some motion. Functional enquiry revealed no other symptoms. In the past there had been a vague history of "spastic colon". There had been no recent gastrointestinal symptoms.

Physical examination was negative except for the following points:

1. The left shoulder was practically frozen. Only a little motion of the shoulder girdle on the chest wall was possible without the production of much pain.
2. The right shoulder joint was partially immobilized, there being possible almost no rotatory movements, though some flexion and abduction were possible.
3. There was gross atrophy of the shoulder girdle muscles on both sides.
4. There was only slight restriction of motion in the spine and hips.
5. All other joints were normal.

Laboratory and Radiographic findings were as follows: Hemoglobin 12.5 gm. per 100 cc. (80%); R.B.C. 4,100,000 per cu. mm.; Color index 0.97; W.B.C. 7,000 per cu. mm. with a perfectly normal differential; Sedimentation rate was 110 mm. per hour (Westergren); Serum Calcium 9.2 mgm.%; Serum Phosphate 3.1 mgm.%; Alkaline Phosphatase 6.6 King-Armstrong units; Plasma Proteins 5.7 Gm. per 100 cc. (albumin 3.4 and globulin 2.3 Gm.%); the urine was normal; Agglutinations for Brucella abortus were negative; Roentgenograms of the right shoulder showed only some generalized demineralisation of the bones. The cervical spine showed a fractionally narrowed intervertebral disc space at C4-5 and no significant bony abnormality. A chest film was negative, as were a barium series and enema. The diagnosis was considered to be Atypical Rheumatoid Arthritis.

From the date of admission to 2nd January 1955, treatment consisted of salicylates, codeine, and physiotherapy. This produced no discernible improvement. On 2nd January Butazolidine was begun and continued to January 8th with no visible effect, except for a fall in hemoglobin from 80 to 64% (presumably due to hemodilution only) and her Sedimentation rate fell from 110 mm. to

71 mm. by the 7th January.

Cortisone therapy was begun on 8th January. The doses were as follows: January 8th to 10th, 50 mgm. four times daily; January 11th to 14th, 50 mgm. three times daily; and January 15th to 20th, 25 mgm. four times daily. These doses are a little larger than one usually employs, and this was done in the hope of getting a rapid increase in the mobility of the shoulders and this in fact did occur.

On 12th January a small boil was noticed over the left costovertebral angle. During the next few days, in spite of penicillin therapy, this developed into a rapidly spreading cellulitis covering an oval area six by four inches. By 15th January this was draining large amounts of pus, and cultures grew a Hemolytic Staphylococcus Aureus (coagulase positive), which was sensitive to no antibiotic with the possible exception of Erythromycin, which was then prescribed.

On 20th January at 11.30 p.m. she began to complain of severe epigastric pain. No nausea or vomiting occurred. At this time her temperature was 98.2° and pulse 64. There was found to be only slight guarding over the right side of the abdomen. Bowel sounds were normal. Pain was relieved by Demerol, 50 mgm. only. On 28th January at 2.30 a.m. the pain was worse again, but examination remained unchanged. At 9.30 a.m. the pain had improved, but the abdomen was distended and tympanitic. Tenderness and guarding on the right side were present. At this time a White cell count showed 21,000 leucocytes. X-rays of the abdomen in prone, sitting and lying positions revealed the presence of free gas in the peritoneal cavity, thus making the diagnosis of a perforated viscus a certainty.

At 1.10 p.m., thirteen and one half hours after the onset of pain, operation was performed. A perforated duodenal ulcer was rapidly located and closed by Graham's method. The abdominal incision was sutured with wire through all layers.

Because of some concern regarding the ability of the adrenal cortex to respond to conditions of sudden stress, such as surgical manoeuvers, in patients who have been receiving large doses of cortisone, the use of the hormone was continued, parenterally, in diminishing doses and finally was discontinued on 29th January 1955. Convalescence was uneventful so far as the operation was concerned. The abscess on the back had been opened at the same time as the operation for the perforation, and it gradually healed. However, the condition of the shoulders rapidly became worse after the cessation of cortisone, and again became just about as painful and stiff as they were before the treatment was started. Her sedimentation rate, which had fallen to 41 mm. by the 21st January, had risen to 107 mm. by the 21st February.

Case 2

This 53 year old man was first seen by me in July 1952, at which time he had classical signs and symptoms of rheumatoid arthritis. Symptoms dated from the fall of 1951, but it was only since March 1952 that the disease had become at all severe. During July and August he was treated with salicylates, codeine and injections of gold salts. This had controlled neither his disease nor his symptoms. He was hospitalized in August 1952, because of his worsening condition. Up to this time there were no known gastro-intestinal symptoms. Cortisone therapy was begun on the 27th of August. The starting dosage was 300 mgm. daily, and this was given for two days. For the next three days, he was given 150 mgm. daily, and thereafter 100 mgm. daily in divided doses. His sedimentation rate fell from 97 mm. to 40 mm. (Westergren), but never did return to normal. He experienced a great deal of subjective and objective improvement, but the disease was never completely suppressed. On September 11th, an infected semi-membranosus bursa was excised: recovery was uneventful, and the operation seemed to have no effect on the course of the arthritis.

The patient was discharged from hospital on 24 September 1952, on cortisone 100 mgm. daily. From then until October 14th, he continued at home, and had been able to reduce the dosage to 87½ mgm. daily. At this time he noticed a little abdominal distress when the stomach was empty, but had no other adverse symptoms except that his disease was poorly controlled. A barium series done on October 24th, showed a large gastric ulcer on the lesser curvature of the proximal antrum, measuring 2.0 by 4.0 cms. There was also some deformity of the duodenal bulb, presumably from a previous duodenal ulcer. The radiologist's opinion was that this most likely represented a malignant ulceration. Operation was advised on this basis, but was refused by the patient.

He was therefore treated medically with an ulcer diet, Amphogel with magnesium trisilicate, and Bardona Capsules. He was advised to reduce the cortisone to 50 mgm. daily, but instead, (having a non-prescription source of the drug) increased the dosage to 100 mgm. daily because of the severity of the joint pains. X-rays of the stomach were repeated on November 20th, (after an interval of four weeks) and showed a very remarkable reduction in the size of the ulcer, which now measured only 1.0 cm. in diameter.

During the next two months, he continued the same treatment, both as regards the ulcer and the cortisone, although he was almost completely incapacitated at this time. In January 1953, another barium series was done, showing the ulcer again, and this time its size had increased considerably. Again the conclusion reached was that most probably the lesion was a malignant one, and that, as

sometimes happens on medical treatment, partial and temporary healing had occurred. Again therefore, surgery was advised and again refused.

During the months of February, March and April 1953, he continued at home on the same type of treatment for his ulcer, and on cortisone. In March and April, he had (without the consent of his physician) increased the cortisone to 125 mgm. daily. Hospitalization was again necessary from 23rd April to 23rd May. During this period it was possible to reduce the amount of cortisone to 75 mgm. daily. X-ray of the stomach on 25th April showed a gastric ulcer at the same site, now measuring 2.0 cms. in diameter. After intensive medical treatment in hospital, further studies on 15th May again showed a considerable decrease in size of the ulcer, but complete healing had not occurred.

At home again, during June, July, and August 1953, he observed the same type of treatment. During this time there had been a slow improvement in the state of his arthritis. However, hospitalization was again necessary on 12th September 1953, due to the gradual development, without a discernible increase in abdominal symptoms, and without any recognizable episode of bleeding, of a severe iron deficiency type of anemia. Hemoglobin was then 46%, R.B.C. 3,150,000 and Color Index, 0.71. (Previously the Hb. had always been in the neighborhood of 70% or better.) It was assumed that he had been slowly losing blood from the ulcer. A barium series done 16th September again showed the ulcer, but now it was, to our surprise, only 7 or 8 mm. in diameter, the smallest in size that had been observed since its discovery eleven months earlier. It was now found possible to reduce the dose of cortisone again, and after correction of the anemia by transfusions, he was allowed home, with advice to discontinue the cortisone altogether over a period of several weeks. He did in fact reduce the amount of cortisone to only 37.5 mgm. daily and continued with a similar ulcer regimen, and oral iron for the anemia. However, early in November 1953, he had more gastric symptoms, and had become severely anaemic (Hb. 37%). Curiously, on November 17th, a barium series failed to show the ulcer at all and as well the colon was radiographically negative. He was again hospitalized for further transfusions and medical care. A gastroscopic examination performed at the time showed a funnel-shaped antrum, which did not transmit peristaltic waves, and which was of a grayish color. This was thought to be due to infiltration of the submucosa with scar tissue or malignant cells. Cortisone was finally discontinued in December 1953. He again required hospital care in February and March of 1954, and at this time, the stomach was considered normal both radiographically and on gastroscopic examination. His arthritis had again become worse, and he was started on "Duracton", an adrenocorticotrophic hormone preparation, in doses of 25 mgm. intramuscularly every second day, and has continued on this schedule since that time. In addition to this, he has received 1950 mgm. of injectible gold salt. In November 1954, because of inadequate control of his pain by the A.C.T.H. he was given, as well, some Butazolidine. This produced further gastric irritation, and another barium series done in December 1954 again showed a gastric ulcer at the original site, but it now measured only 0.3 cms. in diameter. No further information is available as to the state of the ulcer.

Comment: Case 1 is of special interest because of the very rapid development and perforation of duodenal ulcer on cortisone treatment (in just 13 days). While one cannot state categorically that no ulcer had existed before, the lack of symptoms and the negative barium series done only a few days before afford very good evidence that the condition was indeed a new one. No ulcer symptoms or other warning of impending perforation developed, and when it did occur, the findings were not typical.

Case 2 illustrates the apparent development of a gastric ulcer within a few weeks of starting on cortisone therapy. Evidently he had had a duodenal ulcer at some time in the past, as the duodenal bulb was found to be deformed at the first x-ray examination. Ordinarily one might expect a benign gastric ulcer to heal within three to six weeks on adequate medical therapy, and any apparently benign gastric ulcer which does not do so, is very apt to have been a carcinoma instead. This is what we at first thought we were dealing with. In any event, the subsequent course of events seems to indicate that it was the rather large amounts of cortisone that prevented healing, and this in fact did occur later when he was able to reduce the dose to smaller levels. One point for which there seems no ready explanation, is the development of so severe a grade of anemia at a time when the ulcer had apparently healed completely. It is also of some interest that the lesion stayed healed for about a year, while on A.C.T.H. although the dosage was small in comparison to those mentioned in the earlier literature. It was only after the addition of another gastric irritant, Butazolidine, that the ulcer recurred.

One may come to the following conclusions regarding the use of cortisone in relation to peptic ulcer:

1. The known presence of active peptic ulceration is virtually an absolute contraindication to its use.

2. The history of a recently active, perforated or hemorrhaging ulcer is a very strong contra-

indication to its use. Even after months of apparent quiescence, a flare-up might occur.

3. If cortisone must be used in a case of previous ulcer or suggestive dyspepsia, concomitant ulcer therapy ought to be given and adequately supervised.

4. Even apparently minor abdominal symptoms in cortisone patients must be considered seriously, and the possibility of atypical signs and symptoms should be kept in mind.

5. This complication is least likely to occur if cortisone dosage can be kept to the minimum, preferably under 50 mgm. daily.

6. There is a great variability in the time at which a "cortisone ulcer" may occur, and just as great a variability may occur in its subsequent behaviour.

Acknowledgment

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Megaloblastic Anemia of Pregnancy

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Megaloblastic anemia of pregnancy which shows no response to refined liver or vitamin B_{12}, is dramatically cured by folic acid.[1, 2] The mortality of 30 - 40% for the mother and 50% for the babies can be reduced nearly to zero by giving one small tasteless tablet a day.

We report, in this paper, our observations on a patient who had anaemia in three successive pregnancies, the last of which was certainly megaloblastic.

History of Present Pregnancy

Mrs. A. H., age 37, first came to my office on the 20th January 1950; her LNMP was 18th Oct., 1949, and expected date 25th July 1950. Her chief complaints were tiredness, a tendency to faintness with rapid change of position, and an intense and persistent heart burn. Physical examination showed a florid faced woman, weighing 145 lbs., uterine enlargement to a twelve week pregnancy, B.P. 120/80, Hb 12.5 gm/100 ml., Wasserman negative blood group A, RH negative, and urine entirely negative.

She was seen regularly and she always complained bitterly of an intense and persistent heartburn which would wake her even at night, and for which she was given various drugs without effect. On May 4th, she was recovering from a coryza with fever. Her weight was 162 lbs.; B.P. 130/80, there was no albumin in the urine, the uterus was at twenty-eight weeks.

On 3rd June she came saying that beginning rather suddenly on 15th May she had come to feel weak, out of sorts, breathless, and that her knees buckled under her. Her face was still florid, but the skin of her arms, legs, abdomen, and back were a waxy pale. Her mucous membranes and sclerae were pale. Her haemoglobin was 6.2 gm/100 ml., and a blood film showed a macrocytic anaemia. She was admitted to Grace Hospital, Winnipeg.

On the 5th June, complete examination of her blood showed an Hb 5.8 gm/100 ml., r.b.c. 1.63 million/cu mm. packed cell vol. 13.8 m.c.h. 35 yy. m.c.v. 84 c microns, mchc 42%. Color index 1.2, leukocytes 3.2 thousand, polys neutrophils 61, eosinophils 1, metamyelocytes neutrophils 6, lymphocytes 27, monocytes 1, nucleated red cells 4%. The mean cell diameter, as calculated with the Haden-Hausser erythrocytometer was normal, 7.5. microns, and in keeping with the mean corpuscular volume.

Examination of the stained films, however, showed a moderate anisocytosis, with not infrequent cells measuring up to and over 10 microns in diameter. There were also in the peripheral circulation, large erythropoietic cells, with delicate chromatin and prematurely hemoglobinized cytoplasm, which were considered indistinguishable from late or intermediate megaloblasts, and one erythropoietic cell was observed in mitosis. Despite the presence of nucleated erythropoietic cells in the peripheral circulation no reticulocytes were observed. There was a leukopenia, and several of the polymorphs had hypersegmented nuclei. A platelet count was not performed, but appeared low as estimated from the fixed films.

There was a remarkable erythropoietic hyperplasia in the sternal marrow, a good proportion being megaloblastic. Giant metamyelocytes,

characteristically seen in megaloblastic anemias, were also present and there were not infrequent macrophages containing material resembling hemosiderin.

Her icterus index was 5 units; bilirubin direct was 0.3 mg/100 ml and indirect was 0.5 mg/100 ml.

The gastric analysis after histamine showed:

	Total	Free
Fasting	5	0
1st half hour	7	0
2nd one hour	11	4
1½ hours	20	6
2 hours	12	0

It was felt that this was a true megaloblastic anemia of pregnancy, because there was no demonstrable hemolysis, the stomach secreted acid, the peripheral blood was macrocytic, the bone marrow was megaloblastic, and the patient was seriously anemic.

It was decided to treat her with oral folic acid only, repeating the bone marrow smears, 10 hours and 72 hours after beginning therapy, to better follow the changes in erythropoiesis. She was given 20 mgm. of folic acid by mouth and the sternal bone marrow aspirated ten hours later showed a sudden reversion to normoblastic hyperplasia. Response to therapy as mirrored in the bone marrow cytology had obviously begun. Megaloblasts were still present though infrequent, as were giant metamyelocytes. Megakaryocytes were present but infrequent. 20 mgm. of folic acid was continued daily by mouth.

72 hours after the institution of oral therapy a third sternal bone marrow aspiration showed a most remarkable transformation, when compared with the previous aspiration samples. There was now no evidence of megaloblastic hyperplasia, but normoblastic preponderance was pronounced. Immature megakaryocytes were present though infrequent.

Table I shows the bone marrow changes within the erythropoietic series; from megaloblastic (before therapy) to erythroblastic (in 10 hours after the start of therapy) to normoblastic (in 72 hours after the start of therapy).

Table I

Bone marrow changes within the erythropoietic series following folic acid therapy.

	Before Therapy	10 hours After Therapy	72 hours After Therapy
Megaloblasts—			
Early	9.4	1.6	0.0
Intermediate	7.0	1.0	0.0
Late	3.6	1.6	0.0
Erythroblasts—			
Early	2.2	12.6	0.6
Intermediate	3.4	10.0	1.0
Late	1.8	7.4	6.8
Normoblasts	12.2	6.4	58.4
Mitotic erythropoietic cells	.8	.4	1.4
Total Erythroid	40.4	41.0	68.2
Total Myeloid	55.0	52.6	30.8

Figure I illustrates the progressive changes in reticulocytes, hemoglobin, and erythrocytes. On the 8th June, 20 mgm. of oral folic acid was administered, and continued daily. There was no appreciable increase in reticulocytes until 12th June when the count rose to 12.6%. By 16th June, the count was at a peak of 37.4% and remained over 30% until 23rd June when it gradually fell to 1.9% by 10th July. The hemoglobin and erythrocytes rose steadily during and after the decline of the reticulocyte response, reaching levels of 10.3 gm/100 ml. and 3.69 million/cu. mm. respectively on 10th July.

On this date her hematocrit was 32, mcv 76, mch 28, and mchc 24%; indicating that she now had a hypochromic microcytic anemia, and that her reserves of iron had been depleted. Ferrous sulfate grv tid was added to her medication.

The direct Coombs test of the patient's red cells was negative on 10th June and 14th July. No anti Rh antibodies were present.

Her most distressing symptom, the heartburn, disappeared within 48 hours from the start of therapy and her sense of well being returned within a week. She was discharged on 20th June, continuing therapy at home for a month following delivery.

On 23rd July, she was delivered of a normal female 6 lbs. 8 oz., after a normal, uneventful labour of 7 hours 15 minutes. On this date her peripheral blood showed a hemoglobin 10.2 gm/100 ml rbc 3.60 million/cu. mm., c.i. .96, hematocrit 39%, reticulocytes 4.1.

On 28th July her hemoglobin was 10.8 gm/100 ml and she was discharged on 29th July.

Previous Confinements

LNMP 4th August 1945. E.D. 11th May 1946.

There is no record available of this pregnancy but it seemed to be quite normal. She was first seen on the day of confinement.

On 30th May 1946 she was delivered of a normal 6 lb. 10 ounce male who presented as an LOA. At this time she had moderate edema of her legs, her BP was 120/80 and there was no albumin in her urine. There was no undue hemorrhage during or following delivery.

On 3rd June her temperature rose to 103°F., but she did not seem to be unduly ill. 20,000 units of crystalline penicillin was administered intramuscularly OH— but had no effect on her fever

which continued at the same level for the next 3 days. On the 7th June her condition suddenly became desperate, she was delirious, dyspnoeic, confused and waxy pale. Blood examination showed her hemoglobin to be 2.3 gm/100 ml, r.b.c. 850,000/cu. mm., c.i. 1.0 w.b.c. 3.150/cu. mm., and peripheral blood smear was reported as showing a macrocytic anemia.

Her condition was so desperate that no attempt was made to investigate the cause of the anemia. She was transfused with 1000 cc. of whole blood.

On 8th, 9th, 10th of June she received a further 500 cc. of whole blood daily and by 12th June her Hb had risen to 8.3 gm/100 ml., her r.b.c. 3.01 million/cu. cm., c.i. .9. Her peripheral blood smear showed a macrocytic picture.

On 11th June her Hb had risen to 10.2 gm/100 ml., and she was discharged perfectly well.

In retrospect the diagnosis lay between toxemia, hemorrhage, sepsis, and megaloblastic anemia of pregnancy. The confinement had been normal; there had been no undue loss of blood, there was no albumin in the urine, and no rise in B.P., she was the only patient on the ward with a fever, and her illness was sudden. It was felt that she probably had a megaloblastic anemia. Unfortunately bone marrow aspiration was not done.

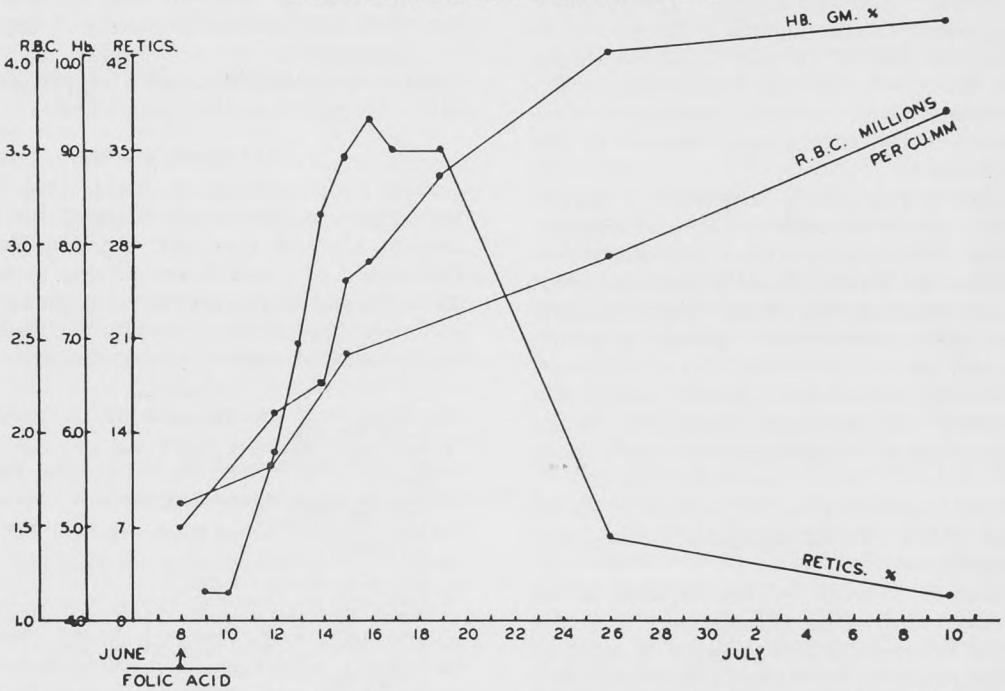
She appeared again on 3rd April 1947. Her LNMP was October 1946, and E.D. 18th July 1947. Her Hb was 11.5 gm/100 ml., her main symptoms were vomiting and heartburn. She had a great deal of energy and felt fairly well.

On 18th June 1947 her membranes ruptured spontaneously and she went into labor on 20th June and was delivered normally of a girl 4 lbs. 14 oz., vertex ROA, and 4 weeks premature.

On 19th June 1947, her Hb was 10.3 gm/100 ml., r.b.c. 3.61 million/cu. mm., c.i.1, cell diam. 7.5/u, peripheral blood smear was reported as macrocytic anemia. She felt quite well and absolutely refused permission for any investigation.

On 21st June Hb was 10.1 gm/100 ml., r.b.c. 3.43 million/cu. mm.; 23rd June Hb 9.3 gm/100 ml., r.b.c. 3.08 million/cu. mm.; 27th Jun 9.2 gm/100 ml., r.b.c. 2.96 million/cu. mm., and smear was still macrocytic. She was discharged on 28th June 1947.

Figure 1
Illustrating the progressive changes in numbers of reticulocytes, hemoglobin and erythrocytes.



Discussion

This patient illustrates through three successive pregnancies a tendency to anemia. Several days following her first pregnancy and labor the anemia became so profound as to endanger her life. During the second pregnancy her hemoglobin dropped 2.1 gm/100 ml. in six weeks, and she exhibited a macrocytic peripheral blood. The premature termination of this pregnancy interrupted any further study. In her third pregnancy she showed a proven megaloblastic anemia which was treated by specific means, dramatically illustrating the immediate response to folic acid with the initiation of the process of maturation of the megaloblast by a minute single dose of folic acid.

The first pregnancy illustrates a common diagnostic pitfall in that edema is misinterpreted as toxemia, fever as sepsis, whereas they are concomitant with anemia.

The only cases of megaloblastic anemia of pregnancy reported in the literature are those which have reached a critical degree and threaten the life of mother and child. One wonders if there are cases of slight and moderate degree which never progress to a dangerous level and hence are never diagnosed.

It is now known that other substances may successfully treat megaloblastic anemia of preg-

nancy viz; penicillin (in small doses)[3], and animal protein factor[4] (APF — of Lederle, now known as aurofax). The former is believed to act by inhibiting certain intestinal micro-organisms and markedly changing the flora of the intestinal tract. Experimental work shows that the concentration of citrovorum factor (produced by folic acid) is increased either by eliminating bacteria that destroy the citrovorum factor or by promoting the development of a flora that synthesize the factor.[5, 6]

Animal protein factor is a fermentation product of Stroptomyces aureofaciens and a by-product of the manufacture of aureomycin. It contains at least four factors in each 250 mgm. capsule; viz. A.P.F. 6.7 mgm. aureomycin, 1/ig of vitamins B_{12}a and B_{12}b and an "unknown factor". The response obtained in megaloblastic anemia of pregnancy to A.P.F. may be due to (1) A.P.F., (2) unknown factors in the A.P.F., (3) the aureomycin acting on the intestinal flora, (4) small amounts of vitamin B_{12} contained in aurofax and "spared" by the antibiotic present.

Folic acid is required biologically for proper growth. Young rats deficient in folic acid manifest a diminution in rate of growth, a subsequent loss of weight, marked diarrhoea and a leucopenia that involves the granulocytic series. Death usually occurs for other reasons before anemia is severe.

In the pig, deficiency of folic acid is characterized by an interference with growth and by the development of diarrhoea and macrocytic anemia with megaloblastic hyperplasia of the bone marrow.[7]

In chicks, deficiency of folic acid leads to suppression of growth, feathering and disturbances in hematopoeisis.[8]

Folic acid is essential for the response of the chick oviduct to estrogenic stimulation.[6] It is also essential for tissue growth in response to estrogen in the genital tract of the rat and the monkey.[10, 11] Presumably, a number of cellular components of tissues which are susceptible to estrogenic stimulation cannot be synthesized in the absence of an essential catalyst derived from folic acid.[12]

It has been observed that there is an abnormal pattern of excretion of hormones in the urine.[2] Critical and essential roles are played by folic acid and vitamin B_{12} in the synthesis of many key components of living cells; it is not surprising that either a deficiency of these factors or disturbances in their metabolic utilization often is manifested first by derangements of hematopoiesis.[13]

Can it be that the extra demands by the foetus and the genital organs during pregnancy deplete the folic acid stores of the mother?

Summary

1. A case of megaloblastic anemia of pregnancy is presented.

2. Immediate responses to folic acid therapy is demonstrated by bone marrow changes 10 hours and 72 hours following beginning of therapy.

Diagnosed in its early stages and properly treated megaloblastic anemia of pregnancy need never develop to serious proportions.

Acknowledgments

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Surgery

Cold Injuries

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Severe cold injuries, such as frostbite and trenchfoot, have always been essentially military problems. They are infrequently encountered in civilian life. At the St. Boniface Hospital during the two years 1953 and 1954 out of 34,951 admissions there were three cases of frostbite, in spite of our rigorous winters. On the other hand, during the Korean War the United States' Eighth Air Force casualties from high-altitude frostbite outnumbered those from enemy gunfire. The horrible possibility of atomic bombing leading to mass evacuation of cities in our frigid country and recent discoveries of immense natural resources in the polar regions which will possibly produce a future northward immigration justifies a renewed interest in frostbite as a medical problem. The following outline of the pathogenesis, pathology, clinical syndrome and treatment of severe cold injuries is based on a review of some of the current literature on the subject.

Pathogenesis

There are two current theories to explain the manner of tissue injury by cold:

1. Freezing can injure tissues.[24] The solidification of the liquid content of tissues will injure the cells, presumably by crystal formation; large crystal formation and expansion within the cell will rupture the cell membrane allowing its liquid content to escape when the tissue is thawed. For example, a frozen plant can be easily recognized because the frozen area is dehydrated. The size of the formed crystals is inversely proportional to the rate of freezing and the rate of thawing; slow freezing and slow thawing produces large crystals. This is a well known crystal phenomenon and applies to all crystalline substances.

In a liquid stage the atoms of a crystalline substance have no relation to one another with regard to any definite position. As the temperature of the substance is dropped to the point of solidification, the motion of the atoms becomes slower. Atomic motion changes from a migratory to a vibratory variety and each atom takes a fixed position in relation to the other atoms in accordance with a geometric pattern called a space lattice. The space lattice may be regarded as a tri-dimensional micro-crystal or a unit cell. The growth of a crystal in size results from a cohesion of a number of micro-crystals. This growth appears to occur most rapidly near the temperature of solidification and more slowly as absolute zero is approached. At absolute zero atomic motion ceases and therefore reorganization ceases.

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Beside the concept of mechanical disruption of cells by crystal formation, viability of the frozen tissues can conceivably be compromised by slow freezing by the fractionation or crystal separation of the colloid content of the cells. As the water crystallizes, the colloids, previously suspended in solution, are separated, precipitated or destroyed by change of surface charges essential to the maintenance of the colloid. Quick freezing and quick thawing will prevent fractionation.

The susceptibility of tissues to injury by freezing is proportional to its water content. Thus muscle, fascia and skin are sensitive to freezing injury in that order.

2. Cooling without freezing can cause tissue injury.[24, 18] Cooling without freezing will cause an anoxic injury by producing prolonged and intense vasoconstriction, increase in viscosity and decrease in flow of blood, and by reduction in oxygen carrying capacity of hemoglobin. The vasoconstriction involves both the arterial and venous side of circulation, probably with a predominance of spasm in the venules. The color of the skin, red color or pallor, has been shown by Jack Adams-Ray and others to be due to the state of dilatation or vasoconstriction of the venules of the skin. There is some evidence to suggest that vasoconstriction in venules is the primary reaction which in turn sets the tone of vascular contraction on the arterial side,[10, 11] and has been shown to be, in part, the cause of edema in rewarmed injured tissue.[1, 2] Venular constriction is abolished by sympathectomy. The increased viscosity of the blood on exposure of the organism to cold is due to fluid lost from the circulating system and to diuresis in reaction to cold. The increased viscosity, slowing of the blood stream due to high tone of the off-flow side of the circulation, together with a tendency to sludging in the capillaries and venules all predispose to the formation of thrombosis in small blood vessels and consequent anoxia to the tissues in that region. Cooling also profoundly affects the hemoglobin oxygen desaturation curve; at 20°C it takes only 10 mm. of oxygen tension to saturate blood as compared to 100 mm. at 37°C. Even though the demand for oxygen for metabolism in tissues is lowered by cooling, at 20°C the demand is not reduced to the extent of reduction of oxygen tension in the blood. It has been shown on tissue cultures by Lake[19] and on organisms by Kreyberg[18] that at 10°C to 15°C temperature range tissue is more liable to injury from anoxia than is tissue at a lower or higher temperature.

The gradient of injury due to anoxia caused by cooling above freezing temperature varies with

the anatomic position of the tissue and its susceptibility to anoxic injury; the distal end of extremities are most affected and the highly differentiated tissue such as nervous tissue is most susceptible.

Pathology

The pathological changes caused by both crystallization and anoxia consist of degenation and necrosis followed by replacement fibrosis, and differ only in the speed of development. The lesion produced by crystallization is more sudden. Colonel Robert Lewis[22] was able to demonstrate necrosis 15 minutes after freezing the muscle of a rabbit's leg. The following is a list of the pathologic changes found on examining various types of tissue affected by cold injury:

Muscle

Because of its high water content muscle is most easily injured by crystallization. Coagulation necrosis indistinguishable from necrosis caused by heat has been described by Lewis and others.[22, 25] In 3-8 days the necrotic tissue is replaced by connective tissue proliferation.[22]

Skin

The sweat glands and sudoriferous glands show degeneration, atrophy, cystic dilatation, and squamous metaplasia.[8] After the 6th week Edwards has described changes compatible with the concept of acrosclerosis;[6] clinically, digits show thinning of the pulp, irregular thickening and shortening of the nails, loss of normal wrinkling, together with rigidity or subcutaneous tissue and vascular spasm; histologically, the epidermis is thinned with flattening of the papillae, collagen fibres of the deeper cutis are thickened and the elastic tissue fragmented, the sweat glands are atrophied and the small blood vessels show swelling and proliferation of the endothelium.

Blood Vessels

Agglutination thrombi found in the small blood vessels do not occur until 24 hours have elapsed after thawing in experimental frostbite according to the studies of Lewis.[22] In the late stages narrowing of the lumen by endothelial proliferation occurs. Clinically the vessels appear prone to spasm; this is easily demonstrated by angiogram in the amputation stumps for frostbite gangrene (Canty & Sharf[3]).

Nerves

These show degeneration of the axes cylinders, demyelinization, lipoid phagocytosis and slight scarring.[8]

Fat

Necrotic lipoid phagocytosis and oil cysts are seen. The adipose lobules show late atrophy and scarring.[8]

Interstitial Tissue

This shows diffuse sclerosis and fibrosis which is probably secondary to soaking of the tissue in edema fluid rich in proteins.[8]

Bone

Sharply defined punch-out cystic areas in juxta-articular position have been described by Vinson and Schatzki.[31] These lesions always appear within eight months of cold injury and are not accompanied by stiffness and pain in the affected joints. Necrosis and osteomyelitis may be found when the overlying tissue has been destroyed.

The Clinical Syndrome

There are two known clinical entities of severe cold injury, frostbite, and trenchfoot. The former is produced by dry cold below freezing temperature; the latter is produced by a wet cold of non-freezing temperature.

Lowering of tissue temperatures involves a balance between the chilling effect of the external environment and the warming effect of the regional circulating system. The chilling effect of environment cold is more effective with lower temperature, air movement, and the application of a conductor of heat to the tissue such as water or a metal. The warming effect of the regional circulation may be impaired by vasospasm secondary to injury or previous frostbite, constrictive clothing, low hemoglobin and a low basal metabolic rate. An interesting phenomenon of vasodilatation in response to cold between 0° and 6°C, had been noted by Sir Thomas Lewis and others in animal and man and has been described as "the hunting reaction.[14, 15, 23] It is a protective phenomenon occurring rhythmically in response to cold and is apparently due to opening up of A.V. shunts in the distal parts of the extremities. The reaction is probably absent in people suffering from vasospastic disorders.

Frostbite

Frostbite syndrome can be described in three stages.[6]

A. The acute stage, which occurs during the first three weeks, is characterized by freezing, thawing, exudation, and initiation of necrosis. The universal immediate symptoms of freezing consist of a sensation of numbness of the affected parts sometimes preceded by a prickling sensation. Before thawing, the frozen area is white; after thawing, there is redness, swelling, moderate heat, and a burning sensation. Blistering occurs in one or two days after thawing; at first the contents of the blisters are clear, later, hemorrhagic. The extent of blistering is no indication of subsequent demarcation of deep gangrene.

B. The sub-acute stage begins three weeks after freezing by the appearance of necrosis which is completely demarcated by the sixth week. Edward A. Edwards and others believe the severity of gangrene is proportional to the duration of freezing after the initial symptoms. This is probably true if the temperature of the extremity remains close to the freezing point of tissues which will permit crystals to increase in size. Vasospasm is

commonly seen in the sub-acute stage.

C. The chronic stage, after the sixth week, is characterized by acrosclerosis, recurrent ulceration and vasospastic phenomenon. Vasospasm and hyperhydrosis gradually disappear in some individuals and become prominent with cold sensitivity in others; pain is a more frequent complaint at this stage not only in the scars of necrosis but also more proximally.

Trenchfoot

Trenchfoot syndrome can also be described in three stages.[32] The first stage, just after removal from water, is characterized by cold feet whose skin is swollen and waxy white with scattered cyanotic areas. There is anaesthesia to touch and temperature. In the second stage, as the extremities thaw, cyanosis, swelling, bleb formation, maceration, hyperhydrosis and gangrene occur. Anaesthesia gives way to tingling and pain. The third stage, usually after 10 days, may be dominated by symptoms and signs of sympathetic over-activity or peripheral nerve involvement, or both.

Treatment

A. Prophylaxis is an important aspect of the problem of treatment of cold injuries. It may be broadly divided into measures taken against cold environment and measures taken to assure adequate circulation in the extremities.

Among the measures to combat cold environment are the following:

(1) Adequate clothing; warm, wind proof, non-constricting clothing fashioned to capture and hold the warm air heated by the body as described by Vilhjalmur Stefansson in his book, "Natural History" in his outline on the clothing worn by the Eskimo. Socks should be smooth and dry; gloves and boots roomy and pliable.

(2) The work of Schuman[26] and Orr on the epidemiology of cold injuries among the United States Armed Forces in Korea showed that knowledge of weather forecast, morale of troops, experience and temperament of the individuals was important in the prevention of cold injuries.

(3) Acclimatization:[16] people exposed to frigid climates appear to acquire an extra layer of fat, and their peripheral circulation improves; the hunting reaction becomes less evident and their peripheral tissues stay at a high temperature.

Measures to assure an adequate peripheral circulation include the following:

(1) Avoidance of constriction, such as tight clothing and tight laces, around the extremities.

(2) Vasodilators, such as hexamethonium bromide, taken prophylactically before exposure to cold by people suffering from vasospastic disorders will give them a certain degree of protection.

(3) Oxygen: Raymond Greene,[13] the physician mountain climber noted the improved peripheral circulation when oxygen was used at high altitudes.

. The treatment of frostbite includes the following measures:

(1) Protection from trauma. There is ample proof that walking on frozen feet will greatly extend the degree of tissue injured. The patient's frozen extremity should be placed at rest, bed rest, until complete healing.

(2) Quick thawing of the frozen areas.[9, 21, 22, 30] The frozen tissue should be thawed in a warm bath, 42°C for 3 or 4 minutes. This process of quick thawing is painful and should be accompanied by the administration of an analgesic. In practice most extremities are already thawed by the time they are first seen; indeed it is often difficult to know whether the extremity had actually been frostbitten and has led some investigators to question the concept of the necessity to have actual freezing or solidification to obtain the gangrene of frostbite.

(3) Treatment of the acute stage which includes edema and initiation of necrosis: Sympathetic block[2, 4, 27] is effective in diminishing edema by the release of venous spasm and appears to encourage early demarcation of gangrenous tissue. Salicylates and heparin administered immediately after thawing will combat the tendency to sludging of the blood and intravascular clotting in the capillaries and arterioles which Lewis has shown develops 24 hours after thawing.[22] Cold-agglutination and pseudoagglutination which is believed by some to be the mechanism of sludging, can be prevented by salicylates. George Fergen has shown that the sedimentation rate of blood can be altered by salicylates in vitro. Antibiotics are administered routinely at this stage to prevent tissue loss by secondary infection. The local treatment during the acute stage is conservative; the frozen tissue is cleaned and surface antiseptics applied and the area covered with sterile bandage or left exposed if the open air method is preferred.

(4) Treatment of the sub-acute stage during which necrotic tissue becomes demarcated is conservative. The necrotic tissue is allowed to demarcate before debridement is performed. Removal of necrotic tissue can be performed without anaesthesia. Kleitsch and Connors found that gangrene affects the muscle more than the skin and bone more than the muscle so that the line of cleavage produces an inverted conized stump which will permit approximation of the skin edges. Any remaining raw areas can be covered by split thickness skin graft. Canty and Sharf[3] in their experience with frostbite in Korea have found that the stumps frequently had to be revised because of breakdown. They attributed this to the poor condition of the terminal arteries in the stump injured by frostbite and prone to spasm.

(5) Treatment of the chronic stage and its syndrome of acrosclerosis includes sympathectomy and local skin care, such as cleanliness, application of lanolin and gentle massage. Rehabilitation of the chronic frostbite is not as demanding as trenchfoot and mainly comprises protection to future cold exposure, graded exercise in the use of the affected limbs and training in the use of a prothesis if required on amputation stumps.

C. The treatment of trenchfoot follows the general lines used in the treatment of frostbite.

(1) Protection from trauma. Sailors who have been exposed to cold and moisture or soldiers who have been exposed to dampness, constriction of the feet, and immobility should be carried on a stretcher and not allowed to walk.

(2) Treatment of the swelling and pain of the second stage: the patient is placed at bed rest with the extremities elevated to allow for more adequate venous and lymphatic drainage. It has been observed by Webster[32] that cooling the extremities diminishes the edema and the pain, cooling may be accomplished through the use of ice packs or exposure of the extremities to an electric fan and moisture applied with an atomizer intermittently:[17] the atomized fluid should contain an antiseptic. Sympathectomy will diminish edema by the release of venous vasoconstriction. Protection against infection; an antiseptic applied locally with an atomizer and antibiotics administered parenterally will protect the damaged tissues.

(3) In the chronic stage treatment of vasospasm, hyperhydrosis, and burning pain, will be relieved by sympathectomy.[27, 28] Gangrene occurs infrequently, approximately 4% of cases, and is treated in manner similar to the treatment of gangrene of frostbite.

(4) Rehabilitation.[32] This constitutes an important part of the treatment of trenchfeet. It includes such measures as toughening of the skin, exercises to increase mobility in the joints of the feet and encouragement in a program of graded ambulation which may be long and trying due to the persistent tenderness of the tissues affected by trenchfoot.

Summary

Severe cold injuries may be caused by freezing of tissues due to crystal formation of their water content, or by cooling, with its consequent anoxic effect on the tissues. Freezing causes more damage in tissues with high water content such as muscle; whereas, cooling affects tissues sensitive to anoxic injury, such as nerves. Frozen or frostbitten tissues suffer less injury if thawed rapidly. The edema in the acute stages of frostbite and trenchfoot can be relieved to marked degree by sympathetic block which releases the spasm in the small veins affected by cold injury. Sympathectomy also relieves the vasospastic condition in the chronic stage of cold injury. A conservative attitude in the treatment of frostbite is generally recommended; moreover it has been shown that due to the damage suffered by the vessels in the frostbitten stump revision is often necessary.

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Orthopedics

The Use and Abuse of Rest in Orthopedic Treatment

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During a recent trip to Churchill, one had the opportunity of observing a 16 year old Eskimo who fractured his leg in an accident in the far North. He had been placed by his parents in an Igloo, and, according to the interpreters, received no special treatment. The boy was kept warm and permitted to lie on the ground, and was fed until such time as he was able to walk. Examination of the fracture of the femur showed that there was about three-quarters of an inch of shortening, the general alignment was quite satisfactory, and there was a full range of movement of the knee joint, five months after the fracture. He was brought out of the far North to a hospital, after some months, but by that time the fracture was united and no further treatment was necessary. This is a striking example of how self-imposed rest alone has given the tissues an opportunity to repair the fracture.

There is no more commonly employed measure utilized by all branches of the medical profession than **rest.** It is prescribed in varying doses from day to day hospital patients and to office patients as well. It is a common question of the patient as to "how much rest and how much activity" may be allowed. It is strange indeed that there is no very clear definition of what therapeutic rest implies. How is one to define "physiological" rest? Many of our pioneer leaders in the profession—such as John Hilton* and Hugh Owen Thomas*—have undertaken to do so. Hugh Owen Thomas* often repeated that rest should be "complete, prolonged and uninterrupted". It might be remembered that advanced diseases and especially tuberculosis were chief amongst the problems of his time. H. Winnett Orr* in defining rest suggests that "Rest is that state of a diseased or injured part in which there is never enough motion or irritation of any other kind to cause pain, muscle spasm, interference with nerve supply or circulation, or disturbance of the functions, local or general, involved in healing and repair."

In some instances, this state of rest must be induced by bed care; in others, the use of local splints, plaster or internal fixation may be preferable—the objective being to immobilize as little of the patient as possible for as short a time as possible, consistent with healing. In many instances no support of any kind is required.

It is still reasonable treatment to give the patient an opportunity to make the most of his own resources, and this is most effectively done by giving the tissues the opportunity of repair to ensure the best physiological balance, by carefully prescribed rest and activity.

The major complications of bed rest with immobility are becoming well recognized and can be referred to briefly in this presentation:

(1) Pulmonary atelactasis:

This is thought to be caused by poor drainage of the respiratory tract, and is encouraged by a lowering of the vital capacity of the lung.

(2) Phlebothrombosis:

The most important site of this complication is the veins of the thighs, calves and feet. Pressure on veins in these situations, with direct injury to the intima is an important cause. It is encouraged by immobility, pillows placed under the knees and calves, and by constricting bandages. Every bed should have an overhead apparatus to allow use of upper limbs.

(3) Pulmonary embolism:

This is the most lethal complication arising from phlebothrombosis and is better prevented than treated after its onset.

(4) Urinary Calculi:

Their occurrence is related to increased calcium and phosphorus excretions and the precipitation of calcium phosphate in the dependent renal pelvis. Frequent turning of the patient and acidification of urine are the most helpful preventative measures known.

(5) Decubitus ulcers:

They occur in the recumbent patient and can usually be prevented by adequate nursing care. However, they continue to occur from prolonged pressure resulting in ischaemia. In the elderly and unconscious patient ulceration occurs with great rapidity.

(6) Many patients become mentally depressed and deteriorated during long periods of bed rest.

The miracles of modern antibiotics and biologicals, "about many of which we know little and administer to patients about whom we know less", should not permit us to lose sight of the basic facts of tissue healing, learned over many centuries.

Examples have been seen in the treatment of osteomyelitis in which the patient, treated by antibiotics alone without adequate rest or protection of the femur, turns up a few weeks or months later with a fracture of the femur, and quite evident wide-spread destruction of the femoral shaft. Antibiotics have attenuated the invader, but the stimulus for repair of the destruction caused by the invasion has also been withdrawn.

Presented at the Clinical Luncheon, Deer Lodge Hospital, Winnipeg, April 5th, 1954.

Orthopaedic surgeons have been the pioneers in the application of local rest, permitting the maximum of activity consistent with the condition under treatment, and are still the best guides. The emphasis of continued function throughout treatment was stressed by Bohler*, particularly in the treatment of fractures. Alexander Gibson* for many years taught students, "to set, fix and use" in fracture treatment.

Smith-Petersen* in 1931 utilized the principle of internal fixation for fractures of the neck of the femur, permitting earlier ambulation of the patient. Corresponding diminution in the period of treatment also has been effected in the treatment of intertrochanteric fractures, and in both instances there has been a very marked improvement in the comfort and morale of the patients treated; and in addition to this, the mortality rate has been at least halved as compared with methods previously employed. It is not an uncommon experience to see elderly patients in desperate condition sometimes with auricular fibrillation who, after a short operative procedure, are able to sit up quite comfortably the following day and be out of bed within forty-eight hours of the time of operation, their pain and spasms having been controlled. This principle has also been applied to fractures of the femoral shaft by the method of Kuntscher* employing intra-medullary nails, and other methods of internal fixation originated by Lane*. Operations on fractures also bring the hazard of interference with normal blood supply, and delayed union and non-union may result. Alexander Gibson* in 1931 introduced a method of bone-grafting of the spine, relying upon internal fixation which in many cases permits earlier safe mobilization of the patient. Andrew P. MacKinnon* amongst others, demonstrated that very young children could be treated effectively by spinal fusion for tuberculosis, which would save many years of recumbency and residual deformity.

Again, the use of the vitallium cup and prosthetic replacement of the head and also the neck of the femur, add the boon of a shorter period of bed-care and earlier, more complete, activity.

The application of major operative methods for the sake of mobilization of the patient must be undertaken in the sober light of possible complications which may attend operation, especially infection. Antibiotics are not always effective in controlling such infections.

The treatment of minimal compression of the vertebral column has been re-examined recently by Nicoll* of Mansfield, England, and others who find that the early active exercises and early mobilization of these cases lower the morbidity rate and enables the patient to return more rapidly to his normal occupation. A simple example of early function with immobilization of the part is found in fractures of the phalanges. Closed reduction of these fractures under local anaesthetic followed by strapping to the adjacent finger with adhesive, frequently permits early movement of the adjacent joints, and adequate healing will result with less chance of stiffness and adhesions developing in the adjacent joints.

There are also many examples of chip fractures of bone, and fractures without displacement, which can be treated by simple strapping and are best not to be immobilized at all. There are many instances of over-treatment of minor injuries which have set off a chain of events which have been disastrous. One such case which began with a chip fracture of the cuboid bone, treated in error by immobilization in plaster, was followed by complaints of pain associated with the presence of osteoporosis. Multiple operations were performed beginning with removal of the chip of bone, followed by neurectomies and a lumbar sympathectomy, all of which have been unsuccessful in relieving the complaint. Such experiences have led one to believe that immobilization can induce pathological changes. Associated changes are:

(1) muscular atrophy
(2) osteoporosis
(3) atrophy and softening of articular cartilage
(4) atrophy and stretching of ligaments
(5) atrophy of the skin.

The work of Deitrick* and Whedon* and others suggest that there are very definite metabolic changes associated with bed rest, combined with immobilization. These are chiefly increased nitrogen and calcium excretion. Deitrick* by immobilizing four healthy young adults in bivalved double spicas to the waist, studied their metabolism under these conditions and demonstrated that there were no very gross changes in the excretion until after ten days. Following this there was almost a doubling of the normal calcium and nitrogen excretion. When fracture or disease, such as poliomyelitis, is also imposed upon the patient it is noted that there is even more nitrogen and calcium excretion. Associated with these changes Deitrick* demonstrated a corresponding atrophy of muscle which in a six weeks' period amounted to four pounds of muscle in the case of each man. The use of tension exercises, frequent turning of the patient and the oscillating bed probably diminished this effect. Deitrick's* experiment suggests that loss of nitrogen and calcium is halved by the use of the oscillating bed.

It was not possible to detect osteoporosis in these normal men by radiological means, but it is certainly possible to detect it in the case of fractures in which prolonged immobilization is necessary, although even without immobilization a lesser degree of osteoporosis is usually demonstrable.

It is apparent,therefore, that there are lesions in which the price of immobilization comes too high. In this group of cases one should include chip fractures which are really soft tissue injuries at their attachment of bone; fractures without displacement; and other fractures, such as, fracture of the shaft of the humerus which can usually be controlled by gravity and the tone of the surrounding muscles. An extreme example of the unreasonableness of immobilization is a sprain of the ankle. Here the pathological process is a strain or partial rupture of the fibres of the anterior talo-fibular ligament on the lateral aspect of the ankle joint. It is not reasonable to rigidly immobilize thirteen other joints and their supporting ligaments in the hope of healing a partial lesion of a single ligament. This method encourages the development of the pathology of immobilization in other structures, including bone. The same may be said for immobilization of ligamentous strains of the knee. When the tibial collateral ligament is strained immobilization of the knee tends to encourage atrophy and softening of other supporting ligaments, such as the anterior cruciate and the capsule of the knee joint. It must be evident that orthopaedic surgeons, not only in the remote but the recent past have been, and still are, keenly aware of the necessity of combining rest and activity in the best possible proportions.

The ultimate solution to the problem of poliomyelitis will come from the research laboratories, from the work of such men as Enders* and Salk*. It is hoped that the disease will be eradicated by wide-spread vaccination. It is too early to say when. In the meantime, the vast majority of disabilities arising from poliomyelitis in those who survive the acute attack of the disease, are the problems of paralysis of the locomotor system, and those patients with real disability are finding their way to orthopaedic surgeons as they have done in the past.

A hundred years of orthopaedic experience have provided a fund of knowledge and a balanced judgment in the application of muscular re-education, splintage and reconstructive surgery — all directed to the rehabilitation of many of these patients to useful citizenship. Recently it has been the policy of those responsible for the organization of the care of cases of poliomyelitis to exclude orthopaedic surgeons from the planning committee organized to deal with the problem as a whole, or to relegate them to a very minor role. The problem of long-range therapy of these cases has not been adequately organized, and in this regard leadership has failed. It has been suggested that in the past orthopaedic surgeons have applied many plaster casts and performed a large number of operations on these cases. It might more fairly be said that rehabilitation of many disabled people has been accomplished by orthopaedic methods. A recent publication of Ritchie Russell*, while excellent in the field of neurology and clinical symptomatology of poliomyelitis, cannot be recommended as a guide for treatment of the weakened or paralyzed muscles. To say that the neurological process is "burnt out after four weeks, based on microscopic study of the spinal cord", disregards other evidence. It is also not consistent with clinical observations, that strenuous exercises often reduce the power of affected muscles and may permanently impair them at a much later date. There is also evidence that the abnormal cerebrospinal fluid findings may be present up to four months after infection.

In many cases judicious splinting of the affected parts may allow local rest with ambulation of the patient. The equally judicious employment of exercise within the capacity of the affected muscle will encourage maximum function. Exercise which produces pain and fatigue is always harmful.

Early mobilization of poliomyelitis cases with paralyzed spinal muscles may result in gross deformities. Spinal exercises alone will not prevent deformity in the presence of muscular imbalance.

If rest was prescribed in too large doses for poliomyelitis twenty years ago, it is not too much to say that the surgeons and medical men alike relied upon rest to a much greater degree in the treatment of all conditions, medical or surgical. In the absence of other treatment, the use of prolonged rest for all medical diseases was in vogue, and in fact has been much slower in its evolution towards activity than the orthopaedic management of poliomyelitis and other problems.

There remain a number of other conditions in which management requires a measure of bed rest until some better solution can be arrived at. It is at present inadvisable to mobilize active thoracic Pott's disease, with or without paraplegia, and bed rest followed by spinal fusion remains the preferred treatment.

Up to the present time it is very difficult to produce an arthrodesis of the hip without a period of some months' bed rest. Multiple injuries of the long bones, and spine also, require bed rest. Acute diseases of the bones and joints which still occur and are sometimes resistant to antibiotic therapy must also require bed rest and a considerable degree of immobilization, for the relief of pain and spasm, and for the prevention of deformity. Rest combined with antibiotic treatments adds to its effectiveness. Osteomyelitis of the spine and the hip are examples.

In the management of the greater number of of these cases, the attending doctor can give the necessary instructions to his patient. In a minority of cases technical assistance of physiotherapists and remedial therapy instructors is

required. There remains a smaller residue in which an organized full-time regime may be required to bring adequate impact to bear upon threatening or persisting disabilities; it is for this latter group of cases that an organized rehabilitation centre is required.

Summary:

To sum up, in every lesion trivial or severe, the two factors—rest and activity—must be taken into account. Sometimes the need for rest is paramount; sometimes the need for activity is more insistent. It is one of the most important duties of the attending doctor to see that a just balance between these two factors is maintained and adjusted to variations in the patient's condition.

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Urology

Translumbar Aortography in Renal Disease

Melville J. Swartz, M.D., C.M.

Translumbar aortography is the roentgenographic visualization of the abdominal aorta and its branches at the moment when they have been rendered opaque by the injection into the aorta of an X-ray contrast medium. This delineation of the abdominal aorta and its branches was described in Europe in 1929 by Dos Santos, and its use in this country was first reported in 1942. It in no way replaces the sound diagnostic methods commonly used to investigate the upper urinary tract, but rather strengthens the foundation on which these measures rest. Arteriography affords an entire new approach to the study of renal disease by an examination of the vessel pattern and correlation of this pattern with a careful pathological study.

Transmuscular aortography was first used very sparingly and in selected cases only, but now it is included as a diagnostic measure whenever information concerning the abdominal arterial system is considered necessary. In renal disease such conditions as renal agenesia, renal duplication, renal ectopia, retroperitoneal tumors, renal neoplasia, cysts of the kidney, and hypertension form part of the list for which translumbar arteriography is indicated. There are many other conditions related to the urinary system for which this method of investigation is most valuable, such as:

Demonstrating aberrant vessels to the abnormally placed kidney.

To visualize the renal blood supply and renal tissue in cases in which the renal mass is undetectable due to ureteric obstruction and a non functioning kidney.

To demonstrate the function of a kidney in relationship to its blood supply.

To reveal the avascularity of an area of a kidney, in which there is space occupying lesion (tumor, cyst, etc.).

To confirm that laking, puddling and pooling of contrast medium in the area of a renal space occupying lesion is pathognomic of tumor.

To differentiate extraperitonal from renal tumors.

Extrarenal retroperitoneal masses may be differentiated from kidney masses by a demonstrable normal renal pattern in the presence of a retroperitoneal mass.

It can also be used for demonstrating hyperplasia and tumors of the adrenal glands.

The question why translumbar aortography is so rarely performed is often asked, and the answer is that there is an unjustified fear of:

(1) Puncturing the aorta, producing massive haemorrhage.

(2) Gut necrosis from accidental injection of the medium directly into the superior mesenteric artery.

(3) Sensitivity to the medium.

In several large series of aortic punctures done on moribund patients upon whom autopsies were performed from several to 96 hours later, and on patients who were operated upon shortly after aortography was performed, there was very little evidence of any extra-aortic bleeding, in spite of the fact that hypertension with diastolic pressures

greater than 110 mm. of Hg. existed in a large percentage of those examined. No cases showed evidence of tearing and in most cases it was quite difficult to determine the site of puncture. In cases where the needle had punctured an athermomatus plaque, no evidence of haemorrhage was seen.

Gut necrosis has occurred in a few cases when 80-90% Sodium Iodide was being used and accidentally injected into the superior mesenteric artery. Experimental work on dogs served to verify this, but the use of organic Iodine media has eliminated this complication.

Sensitivity to the drug to be injected is no greater in translumbar aortography than when employed for intravenous pyelography. This sensitivity can always be checked prior to performing the examination and is a contra-indication.

Any patient who is physically suitable for sodium pentothal anaesthesia can be considered a candidate for translumbar arteriography unless there exists a sensitivity to iodides or the patient is in renal failure.

The technique at first may appear exacting and the films at times a little difficult to interpret, but when employed by carefully trained personnel affords valuable information not obtainable by any other method of examination. The equipment required is simple and the procedure is available in practically all hospitals. The great disadvantage of aortography as commonly used has been that one has been limited to one picture made during injection, which shows the renal blood flow; and a second made just after the injection, when the dye outlines the kidney, as a nephrogram. The development of an inexpensive device carrying a clip of six or seven films, all of which can be exposed automatically in either 5 or 12 seconds, has permitted a far more accurate picture of the renal circulation.

Summary

T. L. A. is the direct injection of contrast medium into the aorta and has given excellent visualization of the renal vessels. It is a simple and versatile method of delineating the vascular supply to the renal mass. Accepting the statement that "the kidney is no better than its blood supply," renal arteriography is of great benefit in determining the renal pattern in all types of abnormalities and anomalies of the kidney. It is a procedure of which the surgeon must always remain respectful, and one which is of great value in the diagnosis of renal and perirenal pathology. Very few untoward reactions other than a mild degree of iodism have been noted.

Mall Medical Group, Winnipeg.

Cancer

Cytological Diagnosis

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"Only the beginnings of cancer
permit a cure". (Celsus).

In the United States 17,000 women die yearly of uterine carcinoma, yet cancer of the cervix is curable in 70 to 80% of cases. These women die for the most part because the diagnosis is made too late.

The reasons for the delay are due mainly to:

1. Insufficient public education,
2. Inadequate medical education,
3. Apparent need for undergoing a complicated procedure (such as biopsy) before cancer is suspected.

The use of biopsy alone for detection of early cervical carcinoma limits the procedure as routine to a gynaecological clinic. If the gynaecologist cannot visualise any suspicious area, he must take several specimens which are "hit or miss". Twenty-five per cent of them fail to include epithelium, and a large number fail to include the malignant area. This difficulty is especially marked in the case of carcinoma "in situ", known by other names as incipient, pre-invasive and intra-epitheliar carcinomata. These cancers have not broken out of their parent epithelium to invade surrounding tissues, and are only detected on biopsy by chance.

Diagnosis by cytological methods depend upon the fact that malignant tumours desquamate tumour cells on to free surfaces, if available; and a more even sampling of material from the entire cervix is obtained. Thus a salient feature of the cytological approach is the possibility which it offers for recognition of cancer in its incipiency; and the vaginal smear test for early diagnosis of uterine malignancy, made periodically in the physician's office, may save many women otherwise condemned to die.

In many hospitals, the smear technique is included in every routine gynaecological examination since the techniques of obtaining smears are relatively easy. The simplest methods are by using cotton swabs. Swab the suspected areas, then thinly and evenly spread the material on albumen coated slides and immediately immerse in an ether-alcohol solution.

Vaginal smears are also obtained by aspirating secretions from the posterior fornix with a pipette

Presented at a meeting of the Department of Obstetrics and Gynaecology, St. Boniface Hospital, March 21, 1955.

attached to a rubber bulb[1]. Cervical smears may be made by aspirating the mucous directly from the cervical os or by scraping the ecto-endocervical junction with a wooden spatula. Endometrial smears are taken by inserting a special cannula into the endometrial cavity to which a syringe is attached. Gentle suction is applied and the aspirated material is spread on slides and fixed. All these slides are wet-fixed in ether-alcohol solution. Patients are cautioned not to douche twenty-four hours prior to the examination. As little oily material as possible should be used in inserting the speculum. Smears, or aspirations mixed with oily substances cause the cells to slough off the slides. The cells usually found are derived from the squamous epithelium lining the vagina and ectocervix; others come from the endocervical mucosa, endometrial mucosa and their glands, and from the fallopian tubes and the ovaries.

Vaginal smears taken before the introduction of the speculum give a more accurate idea of the extent of normal exfoliation, and the presence of bleeding, not due to trauma.[3] They permit better evaluation of prevailing bacterial flora, the detection of any existing parasites, and the recovery of cells from the vagina, ecto and endocervix and the endometrium. Cancer cells are more consistently found in vaginal smears where small carcinomatous lesions are present, rather than in more advanced cases, because less tumour necrosis has occurred.

In our laboratories we classify the cells in five groups. Classes I and II are non-malignant. A class III report is suspicious of malignancy and justifies the ordering of a repeat examination. Class IV and class V cells are considered indicative of cancer.

The cytology report correctly written up by the doctor is of the utmost importance and full details should be given, of radiation, trichomonas infection, hormone treatment, etc. Slides which are allowed to dry before they are immersed in ether-alcohol, or materials that are unfixed immediately present a completely different microscopic picture of the cells, due to enlargement and self-degeneration of cellular material.[2] Extreme degeneration of desquamated endometrial cells often takes place before they reach the vagina and the posterior fornix. Some degree of cervical stenosis is commonly present in post menopausal women and consequently few desquamated endometrial cells pass through the external cervical os into the vagina. All of these factors contribute to false readings, and the final diagnosis of carcinoma should always be corroborated with biopsy before surgical or radiotherapeutic procedures are instituted. The cytological and biopsy methods are not competitors, but are complementary allies to increase the accuracy of the diagnosis.

Besides assisting diagnosis, cell studies are useful in radiation therapy because normal and malignant cells are both affected by exposure to either X-ray or radium and many bizarre and aberrant forms appear. The normal cells are the first to show radiation effects. The cancer cells begin to suffer 24 hours after the onset of treatment, their nuclear characteristics being accentuated.

Normally the number of malignant cells decrease as the radiation-affected normal cells increase. This is considered a good response to radiation therapy. Response in the normal cells usually disappear within 8 to 10 days following the onset of radiation therapy, but occasionally may remain 6 weeks or more. At the end of 3 months however, most radiation changes in deep and superficial cells disappear.

The vaginal smear is also useful in detecting post-radiation recurrences.[2] Following radiation numerous adhesions may develop at the apex of the vaginal vault or a contraction ring of scar tissue may form. These factors make it difficult to determine if a recurrence has taken place in an irradiated cervix. To biopsy such a cervix may be a major procedure, but the presence of undifferentiated malignant cells on post-radiated smears may show a recurrence long before signs and symptoms become apparent. Consequently the study of radiation and post-radiation smears is a valuable means of determining prognosis and the early detection of recurrence.

New steps are constantly being advanced towards better and newer methods. More knowledge and experience enables us to recognize certain characteristic or smear cell types which in some instances make possible the early evaluation of the type of tumour.

Cytologic technique is simple, painless, inexpensive and a practicable procedure in routine gynaecological examination. We hope that we have enlightened you on our methods and purpose and that you will make ample use of our facilities.

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Ophthalmology

The Fundus Oculi in Diebetes and Hypertension

C. F. Benoit, M.D., M.Sc. (Opth.)

It is interesting to note that diabetic retinopathy was first described by Jaeger in 1856. Von Helmholtz demonstrated the first ophthalmoscope in 1850 and in subsequent years other men began to use this new instrument. In the 1879 "Publication of the Ophthalmic Hospital Reports" Edward Nettleship described capillary aneurysms and accurately attributed their presence to diabetes. Hand-painted atlases depicting fundus pathology also appeared during the 25 years following the advent of the ophthalmoscope.

The Retina in Diabetes

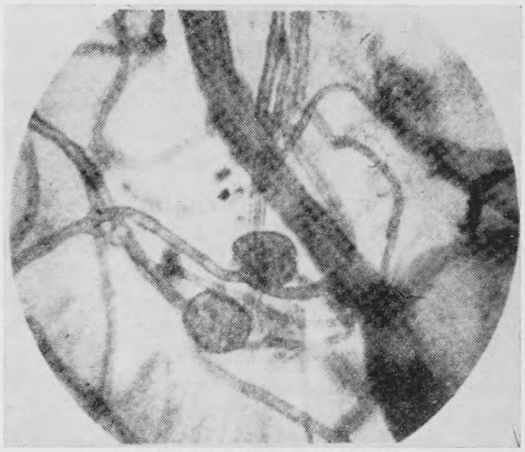
Diabetic retinopathy connotes a number of changes consistently found in the fundus of patients who have had long standing diabetes. The earliest positive change is the appearance of small berry aneurysms situated close to capillaries and found particularly in the macular area. Dilated full dark veins are an early suspicious change. Superficial flame-shaped hemorrhages frequently parallel the veins. This superficial bleeding takes the pattern of the radially-arranged nerve fibres in contrast to more deeply positioned round granular hemorrhages. These deeper hemorrhages are restrained from spreading by the cord-like arrangement of cells and reticulum of the retinal layers.

Yellow waxy plaques are frequently located in the macular area. Diabetic toxic exudates are of a dirty white or yellowish color in contrast to the clean fluffy white of hypertensive cotton wool patches.

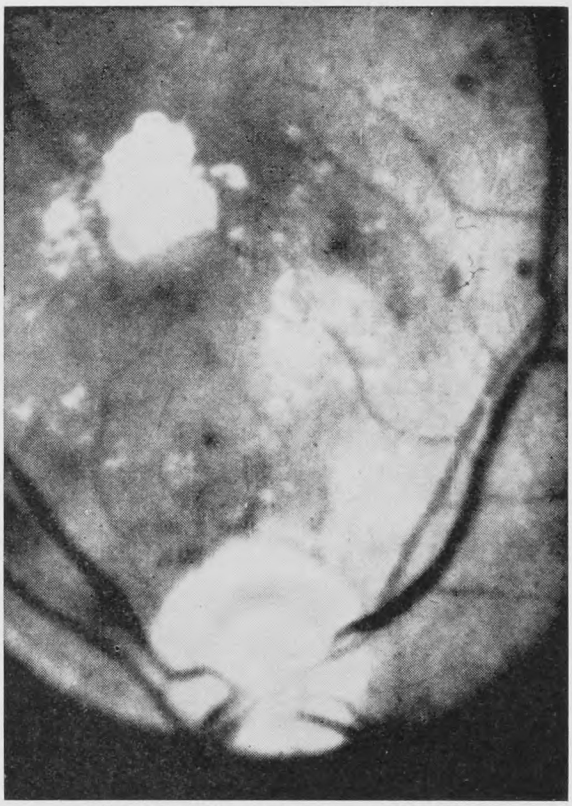
Hemorrhage into the vitreous occurs in the severe retinopathies. In an endeavour to clean up such bleeding, a fine loosely supported vascular network grows out from the retina into the vitreous. This growth originates most often from the disc area and constitutes retinitis proliferans. The new vessel formation is very fragile and gives rise to fresh vitreous bleeding. Eventually scar tissue obscures the macula, hemorrhage clouds the vitreous, contraction of the fibrous elements causes retinal detachment, hemorrhagic glaucoma ensues and the end result is phthisis bulbi.

The incidence of diabetic retinopathy is variously quoted — Dr. Henry Wagener in a recent review quotes as follows — Nonnemacher reports that 129 of 614 diabetics (21%) had retinopathy. In younger persons, fundus pathology is noted after 10-15 years. Many ophthalmologists expect to see retinopathy in most patients after 8 years of known disease.

The exact nature of the retinal lesions and their cause still remains a mystery. Diabetic retinopathy appears to be a disease process involving the capillaries and veins primarily. It has been reported



Diabetic Microaneurysms



Diabetic Microaneurysms, Exudate

that in 50% of cases of diabetic retinopathy examined ophthalmoscopically there is no evidence of retinal arteriosclerosis. The hyaline thickenings of the capillary basement membrane of

diabetic retinae have quite a different staining reaction when compared with similar thickenings in malignant hypertension. This would indicate that there is no direct relationship between these two pathologic conditions, although they may and frequently do coexist.

Study of flat preparations of diabetic retinae reveal saccular aneurysms arising directly from the capillary walls. This refuted the old idea of a pre-existing hemorrhage which became endoethelialized. In spite of the fact that capillary aneurysms can occur in diseases other than diabetes—such occurrences are relatively rare. The observance of aneurysms makes a diabetic diagnosis almost a must.

The yellowish exudate found in diabetic retinopathy consist of round collections of fat filled macrophages. These may be small or they may be fused into conglomerate masses. The waxy plaques are located chiefly in the macular area and often in a circinate pattern.

Prevention of diabetic retinopathy seems to depend solely on the control exercised over the disease. No specific therapy other than good control has been effective. The younger the diabetic, the more retinal damage ultimately appears. Hormones, rutin, high and low protein and carbohydrate diets have been tried without success. Irradiation, sometimes acts in retinitis proliferans by shrinking the proliferated vessels and so obviating further bleeding.

The Retina in Hypertension

Much of the data on the retina in hypertension has been drawn from the classic report of the Committee on classification of hypertensive disease in the retina. This Committee was set up by the American Ophthalmological Society and presented its report in 1946. I do not propose to deal with the grouping of hypertension medically but will describe the changes one sees with an ophthalmoscope.

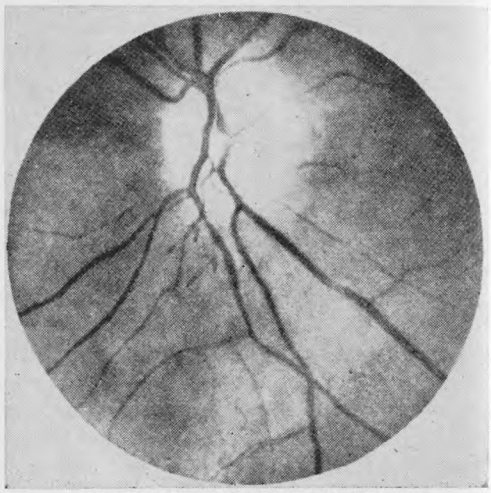
We might well begin with an understanding of what is normal. The walls of the retinal vessels are essentially transparent so that what one sees is a column of blood cells. Arterioles are roughly 2/3 to 3/4 of the calibre of corresponding veins. The vessels cross one another without any appreciable alteration in their course or visibility. The only exception to this last statement concerns crossings in or near the optic disc where the vessels are largest.

The hypertensive fundus is reported as follows by the opthalmologists: Arterioles narrowed grades 0 - 4; hypertensive sclerosis grades 0 - 4; focal constrictions grades 0 - 4. This classification was worked out by Doctors Wagener and Keith of the Mayo Clinic and is more or less accepted as standard in the United States.

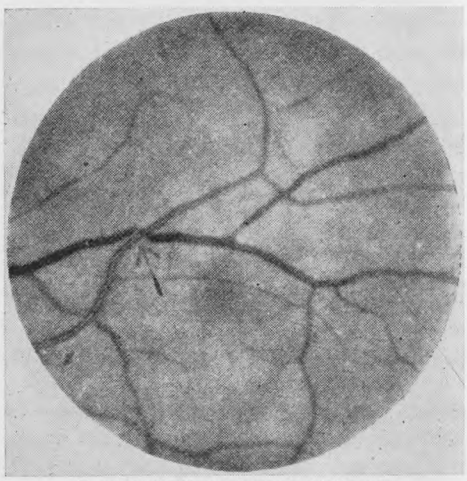
Narrowing of arterioles is fairly straightforward. It consists of a fairly uniform reduction in calibre of arterioles when compared with its companion vein. One must be sure in making such comparisons that the veins are normal—for example: polycythemia and diabetes are associated with fuller veins than usual.

Generalized arteriolar narrowing invariably indicates an increase in blood pressure except in elderly arteriosclerotics and in a few toxic conditions — such as — quinine poisoning; retinitis pigmentosa, etc.

Hypertensive sclerosis is marked by a decrease in transparency of the vessel due to a thickening



Grade I to II Focal Constrictions



Grade III Hypertensive Sclerosis

of its wall. This results in a paling of the blood column and an increased vessel reflex (copper and silver wire phenomena). There is a depression produced in the veins where arterioles cross (nicking and apparent discontinuity of the vein) plus a tendency to force the vein into right angled crossings.

Focal constrictions are short or long segments of excessive reduction in calibre in an arteriole. These constrictions are believed due to spasm. The

changes may vary in amount and sites as the disease fluctuates or is controlled.

There are other phenomena characteristic of hypertensive disease noted in the retina. Flame-shaped hemorrhages are frequent distal to arteriovenous crossings. Sclerosed or pressure hardened arterioles compress and dilate veins causing partial or complete stasis with leakage and gross hemorrhage resulting. Sclerosed arterioles may close off producing an ischaemic-edema of the area supplied by the vessel and also irremedial damage to the visual components of such an area. These vessels are seen as white fibrosed cords in the retina.

The severest hypertensives are recognized group 3 and neuroretinopathy in group 4. Cotton wool patches are white fluffy areas of ischaemic edema located in the nerve fibre layer of the retina. Their exact constitution remains a mystery. They are most often situated in conjunction with an occluded arteriole.

Neuroretinopathy is manifested by papilledema and / or a gross edema of the retina surrounding the disc — this is a feature of group 4 hypertension and without it such a diagnosis cannot be made ophthalmoscopically.

Macular scars are due to a settling of edema residues between the nerve fibres radiating from the macula. These are evidence of an old edema.

There has been no discussion of hypertensive retinal changes from the etiological point of view. This would entail too long and perhaps too controversial a paper. However, the fundus report frequently can be of help in the early diagnosis and differentiate essential, renal and adrenal paroxysmal types of hypertension. Closer cooperation between medical men and eye men is indicated in our hospital set-up.

Case Report

Actinomycosis of the Lower Jaw

Glen F. Hamilton, M.D.

Early in October 1954 a white male child aged 10 years consulted a dentist because of carious teeth. Over a period of a few weeks six "premolar" (left and right lower and upper jaw) teeth were extracted. Towards the end of November an abscess developed subcutaneously along the lower border of left mandible opposite first permanent molar.

Because of this the dentist advised medical attention and the boy was first seen by me 8th December, 1954, when an abscess about 1" long and 5/8" wide was seen in the area described. As it was pointing nicely, a simple 1/4" incision was made and about half a drachm of thick yellow pus was drained. Penicillin oral tablets each of half a million units were given t.i.d. for four days. No swabs or smears were taken. However to exclude any focus of infection in the mandible a radiograph of the area was taken. The radiologist reported 9 Dec. 1954: "Studies were made of the left mandible. Some unerupted teeth of the second dentition are noted. There is no root fragment present, nor any evidence of an infectious process involving the mandible."

On 2 Feb., 1955 the child returned with a recurrence, and thin pus draining through a small central sinus — the site of the former incision. Since there seemed to be no attachment to bone, a decision was reached to excise the area completely.

With pre-operative Nembutal grs. 3/4 and using Procaine 1% without adrenaline a double elliptical incision was made encircling the abscess and it was completely excised down to the mandible.

Closure was done with plain triple O and Dermalon in the skin. The patient was given a second course of oral penicillin and his convalescence was uneventful. One might add that he has received a monthly course of these tablets ever since.

The pathologist reported: "Specimen consists of skin ellipse measuring 3 x 1.3 cm. with longitudinal sinus 0.9 cm. in length. On section it communicates with the subcutaneous area with granulation tissue.

Micro: Chronic skin sinus leading to an abscess. Inflammatory cells are predominately plasma cells with a few lymphocytes and eosinophiles. Etiology is not apparent, further studies will be carried out."

Three weeks later these were done and the pathologist reported:

"Micro: Epidermis shows a central sinus extending into the dermis lined by stratified squamous epithelium. The dermis is edematous and densely infiltrated with polymorphs, lymphocytes, plasma cells and a few oesinophiles. Within the dermis is a colony of Actinomycosis surrounded by a dense polymorphonuclear collection of cells. The subcutaneous fat contains a few scattered lymphocytes. Summary: Cervic facial actinomycosis."

A chest film was taken 26th Feb. 1955 to exclude any infection therein and it was normal.

Four months later this child is perfectly well and there is no evidence inside or outside the oral cavity of any recurrence. Penicillin treatment will be continued for a full year however in monthly stipends.

Discussion: This child was brought up in East Kildonan; last August he visited his uncle's farm at Fannystelle where there are dairy cows in a stable; the chief attractions at that time however were two newly purchased five month old lambs which were in a stall and this little boy and his playmates spent most of one day cuddling the lambs. It is possible the streptothrix lurked in the lamb's wool or in the bedding in the stable and entered through this boy's carious teeth.

Current literature states 50% of cases of actinomycosis occur in the jaw and neck and recovery is usual; 20% of cases are intestinal and recovery today is likely; the remainder are pulmonary and are usually fatal.

In treatment, penicillin and certain of the newer antibiotics are very effective; X-ray and Potassium Iodide seem to be ineffective.

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Book Review

Medicine in Manitoba — The Story of Its Beginning, by Ross Mitchell, M.D. Published by Manitoba Medical Association.

Dr. Ross Mitchell has written a small volume on the history of Medicine in Manitoba. Many who are interested in the history of Manitoba will be delighted with this first attempt at Manitoba Medical Hisory, and every Doctor in the West will find most diverting reading.

History in general has little to say about Medicine, though all historians pay lip service and avow that the health of the people determines the nation's prosperity. This neglect of Medicine by historians has been particularly evident in all that has been written about Manitoba. One may search all the best known accounts without discovering any medical reference, except when an individual medical man wins some distinction in political circles. It becomes necessary for one who aspires to know much about Manitoba's Medical History to examine a large number of more obscure documents and to search in unusual places for new facts. This sort of "Research" has been Dr. Mitchell's enthusiasm for many years. (He cites more than 70 references). Being a native Manitoban, and almost 50 years in practice and teaching, he has the sort of enthusiasm for Manitoba Medicine that must be "bred in the bone".

History in general is largely an account of men and their manners. The history of any particular subject, especially if confined to a limited area, must be almost entirely biographical. For this reason, the main parts of the book are concerned with short accounts of the most famous medical men of the past; but these individual accounts are well correlated to the general history of Manitoba.

It also includes short accounts of the origins of various medical institutions and departments.

This book is highly recommended not only to doctors but also to laymen who are interested in the history of Manitoba.

J. D. A.

"Problems of the Newborn Infant"

A series of case reports and commentaries from the files of the Winnipeg General, St. Boniface and Children's Hospitals, illustrating factors which affect the survival of the infant during his first week of life.

SERIES VII

Kernicterus

Georgina R. Hogg, B.Sc., M.D.
Pathologist, Winnipeg General Hospital
Lecturer, Department of Pathology, University of Manitoba

Kernicterus or nuclear jaundice is characterized by grossly visible, yellow-stained areas in the central nervous system. This condition is confined to infants dying in the neonatal period. It was first described by Orth in 1875. For many years, it was thought to be due to sepsis, hepatitis, erythroblastosis or some undetermined toxin. Following the discovery of the rhesus factor by Landsteiner and Weiner in 1941, the relationship between kernicterus and rhesus immunization was demonstrated. In fact, for a time, many authorities believed that it was always associated with hemolytic disease. However, within the last few years, numerous cases of kernicterus have been reported[3, 2, 7, 13] which are not considered to be due to blood group incompatibility of mother and infant.

In the non-erythroblastotic group of cases, prematurity is extremely common and the birth weight is almost always less than three pounds. Other commonly associated factors are infection, cerebral damage following birth trauma, maternal diabetes, and congenital anomalies. Jaundice, which is prominent in the first day of erythroblastotic infants, usually is not seen the third or fourth day in non-erythroblastotics who develop kernicterus.

Clinically, babies who develop kernicterus, are usually feeble at birth and may be difficult to resuscitate. They have apnea with cyanosis; each apneic period tends to be longer than the one preceding it. Jaundice is present. The eyes are rolled downwards (rising sun sign), in many cases; the forearms tend to be held in extension and extreme pronation. Limpness and lack of interest in feedings, are early signs. Later the child may develop episodic opisthotonos, athetoid movements or muscular twitchings. About 80% of the affected children who survive, exhibit athetosis, or choreo-athetosis which is usually seen first at about the age of three years. Many are mentally deficient and some are deaf. Death when it occurs is usually within five days of birth in the erythroblastotic group with kernicterus. Those in the group not associated with erythroblastosis usually survive more than five days, the majority of deaths occurring from the fifth to fourteenth day of extrauterine life. It is interesting that kernicterus is not observed in babies dying very soon after birth. According to Potter,[9] it is not seen if the survival period is less than forty hours.

At autopsy, kernicterus is seen as bright yellow staining in various nuclear areas of the central nervous system, namely hippocampus, thalamus, hypothalamus, corpus striatum, medulla, olive, pons, dentate and flocculus. Somewhat less commonly the vermis, fornix, grey matter of the spinal cord and of the cortex are involved. These stained areas fade over a period of time on exposure to air or formalin. The yellow pigment is believed, by Vogel,[11] to be mesobilirubin — a reduction product of bilirubin.

The remainder of the autopsy findings vary with the type of the primary disease.

Study of the microscopic appearance of kernicterus in tissues prepared by routine methods is disappointing. The pigment is removed by the processing and it is difficult to assess other changes due to post mortem autolysis. However, Govan and Scott[7] feel that they are able to demonstrate a fairly definite sequence of changes. They found in deaths occurring at four to five days, vascular changes predominate. These consist of congestion, perivascular hemorrhage and thrombosis of the smaller vessels, accompanied by intracellular edema. Somewhat later, degenerative changes of nerve cells take place. These include clumping or even loss of Nissl substance, cytoplasmic vacuolation, eccentricity of the nucleus, karyolysis, and by the ninth day actual disappearance of nerve cells. Macrophages containing brown pigment are occasionally present in the perivascular spaces in the later stages of injury.

There are several theories as to the pathogenesis of kernicterus. Most, however, seem to agree that the staining by bile pigment is secondary to damage of the nerve cells, and that in some way this damage makes them more permeable to bile pigment. It is not known what factor, or factors are responsible for injuring the nerve cells. Many believe that it is damage due to anoxia, since many of these babies have had obvious respiratory distress. The bile pigment is always of the indirect type. Severe jaundice of direct type such as occurs in biliary atresia is never accompanied by kernicterus in infants. Wiener postulated an intravascular agglutination of cells in erythroblastosis fetalis. Day and Perry[4] were unable to demonstrate this however, in a baby who died with kernicterus, but they did find intravascular agglutination in a baby with acquired hemolytic jaundice, who did **not** have kernicterus. Neither could they produce kernic-

From the Neonatal Mortality Study Group, assisted by a Dominion-Provincial Health Grant.

terus in rats, in whom they caused intravascular agglutination. Damage by antibody-antigen reaction may be a factor in the erythroblastotics,[2] although if this is so, it is difficult to explain the fact that the damage appears to occur only after or very shortly before birth. Hypoglycemia or liver disease with accumulation of toxic substances may be responsible in some cases. Sometimes injury due to birth trauma or compression following intracranial hemorrhage appears to be the cause.

There is no treatment of the condition after it has developed but much can be done to prevent it. This is particularly true in erythroblastosis fetalis where kernicterus should be considered a preventable complication and where prompt and if necessary repeated exchange transfusions have almost eliminated this serious and crippling condition. Most authorities agree that if the bilirubin level is kept below 20 mgs. per cent by exchange transfusions, kernicterus is very unlikely to develop. In the non-erythroblastotic group there is no such specific treatment. Good prenatal care will help to prevent premature birth and good obstetrical care will reduce the incidence of injury to the baby as well as antepartum anoxia. General supportive measures for the premature to maintain nutrition and prevent anoxia are important. Wide spectrum antibiotics help to prevent as well as to cure infection. The role which bilirubin plays in the production of kernicterus is not definitely established, but since the bilirubin deposited in the nerve tissue is always of the indirect type, it would seem that any measure which will reduce the amount of indirect bilirubin would be of value. Exchange transfusions are more difficult in the tiny premature but have been done many times and probably should always be done if the bilirubin approaches the critical level of 18-20 mg. per cent. It is possible that cortisone may be helpful in reducing the level of bilirubin in the blood. Perhaps other methods of producing this change may be devised. These are considerations which must always be kept in the mind of both obstetrician and pediatrician in an effort to protect the newborn from this crippling and often lethal disease.

At the Winnipeg General Hospital we have had three cases of kernicterus in a total of 114 autopsies on stillborn and neonatal deaths during the year beginning April 1st, 1954, and ending March 31st, 1955. None of these occurred in cases of hemolytic disease of the newborn. Probably this reflects the prompt use of, and good results obtained from exchange transfusions in this centre.

Case 1.

Female baby, 32 weeks gestation, lived 6 days, 1 hour, birth weight 6 lbs. 12 ozs. Mother, age 23, PO G1, Rh positive, had a normal antenatal history. Labor was spontaneous and normal. The baby breathed spontaneously but breathing was shallow and there was some cyanosis. Her condition deteriorated during the first day with very shallow abdominal breathing and crepitations in both lungs. The second day, her condition improved. The third day her cry was high pitched and muscular twitching was seen. From the fourth day on she had difficult respiration with periods of apnea and cyanosis. Jaundice was marked on the fifth day and opisthotonus was present in the final day of her life. The last two days her stools were frequent, loose and flecked with blood. Blood count was normal on the first and fifth days of life. Urinalysis was negative. At autopsy the baby weighed 1780 grams and was jaundiced. Kernicterus was present. The areas stained were both basal ganglia, an area lateral to the posterior horn of the right lateral ventricle, floor of the fourth ventricle and areas in the cerebellum. There was, in addition, a subarachnoid hemorrhage and a subependymal hemorrhage (both probably anoxic in origin). There was a small bilateral pneumothorax, a bilateral pneumonia and gram positive cocci in lungs and intestine.

Microscopically, the brain showed congestion and edema with petechial hemorrhages. Small areas of the brain showed acidophilic cells which were considered to be evidence of microglial proliferation. No other cytologic changes were seen.

Case 2

Female baby, 32 weeks gestation, lived 6 days, 5 hours. BW-3 lbs. ½ oz. Mother, age 19, Rh positive, WR negative, had had a lobectomy for tuberculosis. Her first pregnancy ended in a miscarriage at 3 months. Her second pregnancy, the present one, was uneventful except for bleeding and lower abdominal cramps for 3 days before delivery which was spontaneous and normal. The presentation was a vertex. The child breathed immediately but on admission to premature nursery there was some subcostal indrawing and cyanosis. Periods of apnea were noted on the first and second day and a large amount of thick mucous was expectorated on the second day. By the third day respirations were somewhat better but there were pustules in one groin. A faint jaundice was present. Antibiotics were given. Her condition remained about the same until the sixth day when she began to have gasping respirations; the color was ashen and bright blood and mucous were passed by rectum. An autopsy the weight was 1240 grams. Jaundice was not marked. Kernicterus affected the corpora striata and medulla. A small hemorrhage was present under the ependyma of both lateral ventricles.

Microscopic sections showed the presence of an interstitial pneumonia with minimal acute laryngitis. The brain showed congestion and edema, but no definite cytologic changes.

Case 3

Male baby, 35 weeks gestation. Birth weight 3 lbs. 1½ ozs. This was the fifth pregnancy of a 31 year old mother. None of the children survived. In all of her pregnancies but the first, she had hypertension. In this pregnancy she had intermittent bleeding lasting 5 weeks and beginning at about 4½ months. She was admitted with hypertension 180/120; albuminuria +++ but no edema. Labor was spontaneous and rather precipitate with the first stage lasting 5 hours 40 minutes and the second stage 12 minutes. Presentation was a footling breech. The child breathed spontaneously but had subcostal and substernal indrawing. The anterior fontanelle was tense. On the second day jaundice was noted and there was scleredema with regurgitation of old blood and mucus. On the third day, respirations became rapid with periods of apnea with some fresh blood and mucus coming from the mouth. This continued on the fourth day. In addition, jerky muscular contractions were seen. Death ocurred on the fourth day. At autopsy, the baby weighed 1480 grams. There was a left tentorial tear with a large subdural hemorrhage. Kernicterus was confined to the right putamen. A coarction of the aorta was present and there was massive right pulmonary hemorrhage. Microscopically the brain showed congestion only. It was felt that the large subdural hemorrhage was the prime cause of death. The coarctation of the aorta probably was not a serious defect as long as the ductus arteriosus remained open. The anatomical site of the kernicterus in this case is interesting. It suggests that the injury of nerve cells was localized and may well have been due to the trauma which produced the tentorial tear, or perhaps to the pressure from the subsequent bleeding.

These three babies were all premature, the gestation periods being from 32 to 35 weeks and their weights at autopsy from 1240 to 1780 grams. Two were female and one male. The male infant died in the 4th day, while the females survived until the seventh day. All the mothers were Rh positive and WR negative. Their ages were 19, 23 and 31 years. In one case there was no antenatal abnormality but the other two had abnormal obstetrical histories.

All of the babies breathed spontaneously but in each case there was shallow breathing or subcostal indrawing; their color was mottled and cyanotic. All had periods of apnea. Jaundice began between the second and fifth days. Two had twitching movements and one had marked opisthotonos. Two had loose blood flecked stools and the other had bloody mucus coming from nose and mouth for the last few hours of life.

At autopsy two of the babies had pneumonia. The other had a large subdural hemorrhage with a tentorial tear, coarctation of aorta and right pulmonary hemorrhage.

Summary

A review of some aspects of kernicterus has been presented, together with a brief outline of three cases occurring in premature infants with no evidence of erythroblastosis fetalis.

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*Weiss, S. & Weiss, J. — "An experimental and clinical Study of a Synthetic Choleretic", The Review of Gastroenterology, 19-10, p. 792-807, Oct. 52.

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Abstracts from the Literature

Uretero-Enterostomy — 5 Year Experience: W. F. Lebbetter and B. G. Clarke, Jour. Urol., Vol. 73, No. 1, January, 1955, Page 67.

The authors report their own immediate and available late results following uretero-enterostomy performed by the Coffey I and by the "combined" techniques. Twenty-five cases of uretero-enterostomy by the Coffey I operation are studied. The mortality was 2 cases (8 percent). Complications were numerous. Second procedures were necessary in nine patients. Strictures of the implanted ureters were common. On the other hand, nine of the twenty-three surviving patients have done well. The authors conclude that the Coffey I operation has been valuable but required improvement. They learned that close supervision and further surgery controlled most of the complications.

In order to evolve an improved technique and avoid strictures, the authors studied various methods. The mucosa to mucosa technique (Nesbit and others) resulted in fewer strictures but allowed reflux of gas and faeces with resultant pyelonephritis.

Since 1950, a combined operation of direct elliptical anastomosis of ureter to bowel mucosa (Nesbit), plus the construction of a tunnel (Coffey) has been practised by the authors. Experimental work demonstrated that the tunnel does, in fact, establish a valve preventing reflux. The mucosal anastomosis reduces the incidence of strictures. The technique of this combined operation is described in detail. Forty-five patients have had this operation in the past five years. Forty have been followed personally and a careful study is presented. Mortality was 6%. Complications are reviewed. Three cases had anastomatic leaks. Pyelonephritis was observed in three cases. Late pyelographic studies are reported, four pelves and ureters normal pre-operatively, have shown permanent moderate to severe dilatation, but with good renal function. Six pre-operatively normal ureters are failures (?strictures). No post-operative urograms have shown gas in ureter or pelvis. Barium enemata have never shown reflux. Renal function studies and investigation of the incidence of hyperchloremic acidosis showed that the poor results were obtained only in those patients who had demonstrably low renal function pre-operatively.

R. L. Cooke

♦

A New Triple-Lumen Tube for the Diagnosis and Treatment of Upper Gastrointestinal Hemorrhage. Marvin M. Nachlar, M.D., Baltimore. The New England Journal of Medicine. 252: 720 April 28, 1955.

A triple-lumen tube with an inflatable balloon to obstruct the cardiooesophageal junction and having two lumens, one with openings proximal to the balloon and the other distal is used to functionally separate the contents of the oesophagus from the stomach. This tube is useful in aiding the localization of the source of bleeding in patients with peptic ulcer, oesophageal varices, gastritis and hiatus hernia. It is thought that blood may enter oesophageal varices from submucosal veins of the stomach which cross the cardiooesophageal junction and periosophageal veins, which send perforating branches through the wall of the oesophagus to join the varices.

Compression at the cardiooesophageal junction may prevent blood flow to the varices from the submucosal gastric veins helping to control oesophageal hemorrhage or in distinguishing the source of bleeding. Up to the time of writing of this article the tube had been passed in twenty patients successfully. In eighteen cases the impressions received from using the tube were later substantiated by other means. In the other two cases the proof of the bleeding site shown by the tube could not be definitely established.

H. Prosen.

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Thurber, James. The New Yorker, May 28/55. Page 28.

The Psychosemanticist Will See You Now, Mr. Thurber

" . . . The psychosemanticists will specialize in the havoc wrought by verbal artillery upon the fortress of reason. Their job will be to cope with the psychic trauma caused by linguistic meaninglessness, to prevent the language from degenerating into gibberish, and to save the sanity of persons threatened by the onset of polysyllabic monstrostitis . . . ".

Reading medical literature is a sure method of becoming a convert to Mr. Thurber's views on modern English usage (and abusage). In this witty, clever, and satirical article, he lampoons American English. He discusses the spoken and written language of today in politics, radio programs, and newspapers. The medical profession receives its due.

If I fail in persuading you to read his article, I give you this excerpt. Mr. Thurber was a patient in hospital and he writes this: "The day I got dressed and was about to leave hospital, I heard a nurse and an interne discussing a patient who had got something in his eye, "It's a bad city to get something in your eye in," the nurse said. "Yes," the interne agreed, "but there isn't a better place to get something in your eye out in". I rushed past them with my hair in my wild eyes, and left the hospital. It was high time too . . . ".

Recommended reading.

Robert L. Cooke, M.D.

The Splenic Flexure Syndrome, W. Spaeth. North Carolina Medical Journal. 16: 49-52, 1955.

The splenic flexure syndrome may be confused with coronary artery disease. It is thought to be a variant of spastic colon. Signs and symptoms include aching or fullness of the left anterior chest in the precordium. This may extend to the left shoulder, arm, and rarely, to the wrist. Abdominal fullness or vague discomfort is frequent. Physical and x-ray findings reveal gas in the region of the splenic flexure. Differential diagnosis includes acute myocardial infarction, renal disease, duodenal ulcer, and left spontaneous pneumothorax. History and apropriate laboratory studies usually exclude these diagnoses. Etiology and treatment are discussed. Treatment consists of measures designed to relax spasm of the intestinal tract. 24 cases are reported in tabular form.

Arnold G. Rogers.

Observations and Considerations on Cigarette Smoking, M. C. Myerson, M.D. Annals of Otology, Rhinology and Laryngology, 64: 412-417, June, 1955.

Up to the present time no proof has been offered to show a cause and effect relationship between cigarette consumption and cancer of the lung. A carcinogenic agent capable of producing cancer of the lung has not been isolated from cigarette smoke. If an active carcinogen were present in cigarette smoke, one should expect a greater incidence of cancer of the larynx. This is not the case, however. Smoking does not effect the nose or sinuses. Post-nasal drip is encountered in varying degrees in all smokers, and this is due to increased mucous secretions mainly in the nasopharynx. Changes are commonly seen in the larynx in the form of edema, fibrosis and eventually an edematous fibroma. Hoarseness is the initial symptom. In the trachea and the bronchi the most frequent effect of excessive smoking is cough —caused by acumulation of mucus due to stimulation of the mucus glands. In conclusion, the author states that excessive smoking affects the larynx, pharynx and tracheobronchial tree. The relationship between cancer of the lung and excessive smoking, though suggested by statistical studies, has not yet been scientifically established.

Jack A. Rubin, M.D.

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Medical History

"1855"
Part I

J. D. Adamson, M.D., M.R.C.P. (Ed.), F.R.C.P. (C)
Professor of Medicine, University of Manitoba;
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Deer Lodge Hospital

It has been frequently reiterated that medicine has advanced more in the past hundred years than during all the preceding ages To estimate the truth of this generalization would produce a prolonged and futile argument; there is no way of placing absolute or even comparative values on periods of history, nor on the contribution of various ages or individuals.

How can one decide whether the contribution of Vesalius in 1543 was fundamentally greater than that of Fleming four hundred years later? Who knows whether Harvey's work, in the final analysis, was more important than Pasteur's? There are a thousand such questions which could provide diverting discussion but no final answer: I shall resist the temptation to stray into these vague, vexed regions of speculation.

One must, as in the discussion of most abstract matters, define and limit the terms. I therefore propose to be largely pragmatic and will try to indicate the purely practical implications of the period of 100 years ago. To the "pure" scientist and to those who are spiritually inclined, this utilitarian point of view may be distasteful, since it implies a degree of materialism and even commercialism. But these are the inevitable by-products in the ultimate goal of all scientific activity, which is after all eminently practical, aiming simply to improve the living conditions of Man; to prolong and enlarge his days and to make them less distressing. Judged on this basis it is true to say that the past 100 years have done more for mankind than all ages before. This is well attested by the doubling of life expectancy, the dramatic reduction in epidemics and the general reduction in suffering, physical and psychological.

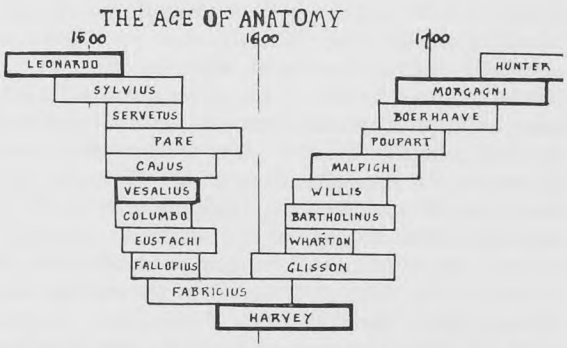
It is not suggested that because there was no conspicuous improvement in medical practice from 500 B.C. to 1850 A.D., medicine as an art, a science and a philosophy, was therefore dormant. There was unquestionably a most significant revival in the 16th century which paralleled and arose from the same fundamental sources as the revival of other branches of science and culture. Following this, there was a period of 300 years—let us say from 1550 to 1850 — which may be regarded as the gestation period of modern medicine. During this period much significant and necessary growth was taking place, but little of practical value emerged. About 100 years ago, after 300 years of gestation, modern medicine was born. Then all the laborious basic work in medical science for the first time began to pay dividends in improved human welfare.

Let us examine this three hundred years of smouldering science and allow me to justify the statement that it was unproductive from the point of view of the patient.

The first two hundred years was almost completely dominated by the anatomists. Though Leonardo da Vinci (1452 - 1519) was first in the field, it is doubtful that his work had any immediate effect. His manuscripts and anatomical drawings have only recently come to light. However, he may have had a considerable influence by personal contact with contemporary anatomists and artists. The real leader was, of course, Vesalius (1514-1564) who demonstrated that anatomy must be studied by dissection, and that the Galenic ideas needed much revision. His text book remained the centre about which almost the whole of medicine was taught for at least two hundred years. He was followed by a multitude of disciples, each of whom made some contribution to anatomy and dominated the medical faculties of all the Universities.

Chart I shows the chronological relations of some of the most famous contemporaries and followers of Vesalius.

Chart I



The complete ascendancy of anatomy is illustrated from the life of Morgagni (1682-1771), who was appointed to the chair of Medicine in Padua in 1720, but because of his outstanding talents was soon promoted to the most desirable chair in the University—anatomy. This he occupied for nearly 50 years, when he died at the age of 90. During this time, of course, he became "the father of pathology" and incidentally of 15 other children. The importance that he placed on dissection is indicated in an incidental comment

1. Paget (Stephen) Life of John Hunter, 1847.

Read before Medical History Society, March 31, 1955.

when giving the history of a woman who had calcific aortitis. He says "she died at the time when the body of a woman was wanted to furnish the public demonstrations of the year 1731, a little before the middle of March". That a great man in his serious records should consider such a comment to be appropriate, demonstrates how completely his activities were controlled by anatomy 200 years after Vesalius.

But all these years of dissection did nothing for effective practice. It no doubt gave surgeons a great deal of information. This had the effect of making them bolder, which was a bad thing for mankind in that era. Surgery reached a high peak of popularity during and after the time of John Hunter (1728-1793). One reads of crowds of students following his successors, John Abernethy (1764-1831) and Sir Astley Cooper (1776-1841), while the humble physicians were content to have one or two followers. But surgery then was done in an atmosphere steeped in blood, sweat, pus and tears, and one would judge from the records that it did more harm than good. Some few surgeons, notably Ambrose Pare (1509-1590) may have come out with a credit balance, but in general, surgery was brutal and blind.

Possibly it is true to say that the anatomy of the 16th century to a large degree produced the physiology of the 17th. Certainly the observation and classification of anatomy was a necessary prelude to the speculation of physiology. But in an age where every sort of science and every sort of cultural activity was so vigorous and so independent, it is difficult to say how each influenced the other. Rather than engage in barren speculations, it is easier to accept the usual English point of view about the new physiology. It goes something like this: Harvey was a bright and energetic young anatomist who, in 1598, at the age of 20, was driven by his enthusiasm for medicine to Padua, which was the most celebrated medical school of the day. There he studied under Fabricius ab Aquapendente (1537-1619) who was then over 60 and though physiologically a Galenist, had been caught in the anatomy stampede. Among other things Fabricius demonstrated the valves of the veins, but failed to appreciate their physiological significance. From this starting point Harvey is supposed to have conceived the circulation of the blood and this was the birth of physiology, by which in turn the practice of medicine was revolutionized. This is a simple and comforting story, and perhaps we should leave it at that. The real facts are not so simple. Physiological investigation of a similar sort was in progress in all parts of the civilized world, and one may read, without profit, volumes of controversy over precedence in various fields. For example, claims for the discovery of the circulation of the blood go right back to Plato who says: "The blood is forcibly carried round to all the members". However, any practical effect of Harvey's demonstration was negligible, and two centuries elapsed before it changed medical practice. It is astounding to discover how very slowly the full significance of the circulation made itself felt; certainly it did not revolutionize medicine.

To illustrate I should like to refer to an incident in the life of John Hunter. He was born in 1728, exactly 100 years after the publication of Harvey's book. In 1773, when he was 45 years old, he had an attack of acute epigastric pain which is commonly said to have been angina pectoris, but since he had no other trouble of the sort till ten years later, and because of the type of pain, it seems likely to have been an acute attack of gallstone colic. His own account follows:[1]

"I had the gout in my feet three springs successively, and I missed it the fourth. In the fifth spring, one day at ten o'clock in the forenoon, I was attacked suddenly with a pain nearly about the pylorus: it was a pain peculiar to these parts, and became so violent that I had tried every position to relieve myself, but could get no ease. I then took a tablespoonful of tincture of rhubarb, with thirty drops of laudanum, but still found no relief. As I was walking about the room, I cast my eyes on a looking-glass, and observed my countenance pale, my lips white, and had the appearance of a dead man looking at himself. This alarmed me. I could feel no pulse in either arm. The pain still continuing, I began to think it very serious. I found myself at times not breathing; and being afraid of death soon taking place if I did not breathe, I produced a voluntary action of breathing, working my lungs by the power of my will. I continued in this state three-quarters of an hour, when the pain lessened, the pulse was felt, and involuntary breathing began to take place. During this state I took madeira, brandy, ginger, and other warm things; but I believe nothing did any good, as the return of health was very gradual. About two o'clock I was able to go about my business.

"Here, then, was a suspension of the most material involuntary actions, so much so that the involuntary action of breathing stopped, while sensation and all the voluntary actions were as strong as before.

"Quaere, what would have been the consequence if I had not breathed? At the time, it struck me that I should have died; but that most probably would not have been the consequence, because, most probably, breathing is only necessary for the blood when it is circulating; but as there was no circulation going on, so no good could have arisen from breathing".

It is truly surprising to find that 150 years after Harvey, the greatest medical man of the day should have had such a fantastic idea of the circulation.

He actually believed that the circulation was an intermittent function; this is possibly a relic of the Galenic theory of ebbing and flowing in the veins from the liver to the periphery.

But even up to 100 years ago, the best opinions about the cardiovascular system were primitive according to our standards. Sir Henry Halford (1766-1844) who was physician to George III, George IV, William IV and Victoria, provides us with an amazing sample of the pathological thinking of his time. He was an accomplished scholar, and by far the most fashionable and successful London physician of his day. In 1833 he published a small volume entitled "Essays and Orations". One of these is on the subject of "phlegmasia dolens", in which three cases that occurred in men are described because of their supposed rarity, except after childbirth. He gives a very circumstantial and flowery account of the Earl of L., which follows:

"The late Earl of L. suffered with this disease many years before his death, and bore marks of it to the last, in a swelling of the left leg and thigh, and in the varicose state of the veins from the ankle to the groin. He was attended by the late Dr. Pemberton in the first instance, and the symptoms were palliated from time to time; but he remained subject to repeated attacks of the same painful malady; and I am persuaded that the obstruction to the circulation of the blood, occasioned by the original inflammation, gave rise at length to that disease of the brain which incapacitated him for the business of his great office, and ultimately deprived him of life.

"When I first attended him, some three years before his death, I found him subject to temporary congestions in the liver, which were relieved by small repeated doses of calomel, followed by purgative draughts containing neutral salts. But there was something extraordinary in his pulse which attracted my particular attention. It was most unusually slow, beating only 44 pulsations in a minute, whereas I learnt that the original habit of it was to give seventy-four strokes in that space of time. This was ingeniously conjectured by Sir Astley Cooper, (1768-1841), Surgeon to George IV and Queen Victoria (1768-1841) who had attended him with Dr. Pemberton, and had witnessed repeated attacks of the inflammation of the veins, to be attributable to an obliteration of the external iliac vein of the side affected; by which the blood was returned to the heart more slowly, and the vital organ was not stimulated thereby to contract itself till after longer intervals than had been its custom. The good reason and propriety of this conjecture was abundantly confirmed by examination of Lord L's body after death, when the left external iliac vein was found to be impervious for several inches, and what is remarkable, the corresponding vein on the right side was ossified.

"It is not improbable that the stroke of apoplexy which brought his life into imminent hazard when it occurred, and which destroyed his mental powers for the whole year during which he survived it, was referable to the same obstruction to the return of the blood towards the heart from the lower extremities; nor was it unlikely that a large accumulation of blood in the sinuses of the brain (in consequence of an impediment to its ingress from the vena cava descendens, into the right auricle, caused by the heart's preternatural delay in contracting) should occasion an effusion of serum into the brain. This was the case, in fact; and at least four ounces of lymph were deposited in its substance, in an unnatural cavity extending from the roof of the ventricle to the pia maternal covering of it. Alas! How fearfully and how wonderfully are we made! and on what a thread does this proud distinction of man, his reason, and his life depend! What momentous consequences do sometimes follow the slightest derangement of the economy of our curious fabric! The inflammation of the vein, from whatever cause it arose, (the most probable one was exposure to a cold March wind in a rather thinner dress than usual) appeared to give way to appropriate remedies, and was not thought of any importance beyond the pain and inconvenience which it occasioned at the moment; but it was destined to produce a tragedy, some time after, of unusual interest and distress; Lord L. married subsequently to the first attack of the disease, and was directing the affairs of this great nation at the height of its glory, when the matured consequences of this disturbance of the circulation, by a common cold, deprived him of his intellect and his life".

This case history serves to illustrate that over 300 years after Harvey the circulation and its disorders were still poorly understood. One must admire the imagination and ingenuity of Sir Henry and Astley Cooper in their efforts to account for the slow pulse and the cerebral accident. However, it is obvious that cardiac physiology, as we know it now, to them was a closed book.

The flare for anatomy inevitably produced the morbid anatomists. They occupied the most conspicuous part of the stage from 1750 to 1850. The chronological chart (Chart 2) indicates some famous men in the 18th and 19th centuries. It will be seen that most of those after 1800 are remembered because they discovered and described some gross morbid, anatomical change, and correlated it with the clinical picture. This was a necessary step in general development, but again very little benefit came through to sick people.

There are a few exceptions to the sweeping statement that this period produced nothing of

practical value. Jenner's introduction of vaccination was the greatest of these, and indeed the first great step in preventive medicine. Curiously enough, it did not arise as a result of the previous spade work in any branch of science, but largely by accident. He was so credulous as to believe a dairy maid who insisted that she could not get small pox because she had cow pox. But of course it is only fair to add that having worked with John Hunter he was filled with scientific curiosity with which the period was inspired, and also he had had training in methods of experimentation. Perhaps, also, we should further relent in our judgment that this age was unproductive and allow that Pineal accomplished something for mankind. He was the first to apply humane methods in the treatment of the insane.

We may search this whole period in vain for any other advance in treatment. Even though Laennec made it possible to diagnose the grosser pulmonary disorders, he introduced no new ideas on treatment. All the contributions from Morgagni to Virchow made little difference at the time to the individual. Though Bright, Addison, Graves, Stokes, Rokitansky and a hundred others made spectacular discoveries, nothing of value accrued to the patient.

Indeed, one would much prefer to have been treated by Hippocrates or Galen, than by the King's physician of 100 years ago. There are many historical examples of t h e horribly damaging therapy in c o m m o n use up to recent times. Possibly the most striking is the account of the treatment of Charles II during his final illness in 1685.

"First he was bled to the extent of a pint from a vein in his right arm. Next the shoulder was cut into and the incised area "cuped" to suck out an additional eight ounces of blood. An emetic and purgative were administered and soon after a second purge. This was followed by an enema containing antimony, sacred bitters, rock salt, mallow leaves, violets, beet root, camomile flowers, fennel seed, linseed, cinnamon, cardamon seed, saffron, cochineal and aloes. The enema was repeated in two hours, and a purgative given. Then the king's head was shaved and a blister raised on his scalp. A sneezing powder of hellebore root was administered, and also a powder of cowslip flowers to strengthen his brain. The cathartics were repeated at frequent intervals, and interspersed with soothing drinks composed of barley water, licorice and sweet almond. Likewise white wine, absinthe and anise were given, as were also extracts of thistle leaves, mint rue and angelica. For external treatment, a plaster of Burgundy pitch and pigeon dung was applied to the King's feet. The bleeding and purging continued, and to the medicaments were added melon seed, manna, slippery elm, black cherry water, extract of lime, lily of the valley, peony, lavender and dissolved pearls. Later came gentian root, nutmeg, quinine and cloves. The King's condition did not improve; indeed it grew worse, and in the emergency forty drops of extract of human skull were administered to allay convulsions. A rallying dose of Raleigh's antidote was forced down the King's throat: this antidote contained an enormous number of herbs and animal extracts. Finally bezoar stone was given. Alas, after an ill-fated night, his majesty's strength seemed exhausted to such a degree that the whole assembly of physicians lost all hope and became despondent. Still, so as not to appear to fail in doing their duty in any detail, they brought into play the most active cordial. As a sort of grand summary to t h i s therapeutic debauch, a mixture of Raleigh's antidote, p e a r l julep and ammonia was forced down the throat of the dying King".

When we read this fearful catalogue of therapeutic atrocities, we feel that perhaps the other King Charles, his father, who met his end swiftly under the sharp axe of the headsman, had a better death.

There is much non-medical evidence to indicate that many thoughtful people in the 18th and 19th centuries realized the futility of the current medical treatment. Joseph Addison (1672-1719) in his essays makes frequent derogatory reference to therapy. Lord Byron (1788 - 1824) protested violently, but in vain, against phlebotomy, which finally pushed him over the brink.

No doubt the therapeutic depravity of the 17th century was to some extent ameliorated before 1855. But there are other examples which show that in general there was at least no improvement over the Greek methods. We may again draw an example from Sir Henry Halford. Among his "Essays and Orations" one deals with "Deaths of Some Illustrious Persons of Antiquity". The following quotation will illustrate his beautiful style of writing and also his attitude to the diagnosis and treatment of pneumonia.

"Crassus, the eminent Roman orator and friend of Cicero (106 B.C.-43 B.C.) died of a pleurisy. He had been speaking with great animation and effect in the senate, when he was seized with a pain in his side and broke out into a profuse perspiration. On going home he had a shivering fit, followed by fever. The pain in the side still continued, and he died on the 7th day of this disease. The terms of deep sorrow in which Cicero laments so feelingly and so beautifully the loss of this eminent man, may justify the regret of physicians, even at this distant period, that it has not been transmitted down to them what resources of our art were resorted to in order to save a life as valuable to his country. Thus much, however, we do know, that Celsus (25 B.C.-50 A.D.) who lived not many years afterwards, suggests the proper treatment

of a pleurisy by bleeding, cupping, and blistering; all the expedients, in fact, which we use at this era of improvement in the art of medicine. We may rest assured, therefore, that nothing was left undone to save this distinguished person; and that the regret of his friends was not aggravated, nor their grief rendered more poignant, by any consideration of that kind".

This shows that Sir Henry could not differentiate pleurisy and pneumonia, and admits that even in that "era of improvement" the treatment was no different from that used by the Greeks.

Before we leave the gestation period, and lest you feel that I have been too destructive and supercilious, I should like to make some general comments upon it. First of all, the whole period was electrified by a universal and insistent aspiration for new learning in medicine. This was part of a similar impulse in all other fields of science, philosophy, religion and the arts. Its genesis in medicine was as complex as it was in music, literature or any other activity, and has been the subject of libraries of books. All we can say is that a combination of circumstances produced a long series of enthusiastic investigators who, under most difficult circumstances, worked out the details of human anatomy, and began the study of physiology and pathology as we know it. Also, we must note that some practitioners returned to the direct objective study of sick people, as had been practiced by the Hippocratic school. In England, this attitude was particularly exemplified by Sydenham (1624-1689). It is interesting to note that Sydenham was not a great classicist, nor was he a product of an anatomical school. He was not even a fellow of the Royal College. He was an individualist who resolutely returned to Hippocratic practice. John Hunter (1728-1793) almost precisely 100 years later, did a similar service for surgery. He also was a rugged individualist who scorned classical education and educated himself on anatomy. This tendency to make medicine and surgery rational and objective was in practice the greatest feature of this period. In this, of course, some went too far and extreme schools of thought arose. The iatro-chemical school believed that the human body was in all respects like a test tube; the iatro-physical school considered it to be a machine entirely dominated by the laws of physics.

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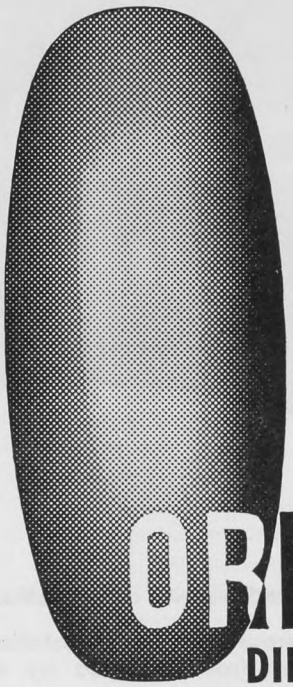

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Editorial

S. Vaisrub, M.D., M.R.C.P. (Lond.), F.R.C.P. (C.), F.A.C.P., Editor

Fundus Oculi

This year marks the centenary of an obscure and modest event — the publication of the first atlas of ophthalmoscopy. Illustrated by Edward Jaeger of Vienna in 1855, this masterpiece of painstaking precision revealed to the medical world the wonders of the retina, and stimulated its interest in the fertile field opened up by the newly invented (1850) Ophthalmoscope.

Small, compact, pocketable, yet very impressive, the ophthalmoscope has attained an eminent place in our diagnostic armamentarium. It has become the guide of the ophthalmologist, the faithful friend of the physician, and the counselor of the consultant. Despite its complicated structure, it is a simple instrument to use. No elaborate technique is required. Anyone with experience in peeking through key-holes can become an expert in its use, and is likely to find pupil-peeking equally rewarding and revealing.

Just how revealing fundoscopy may be is illustrated by the results of an investigation conducted by Curtis D. Benton, Jr., at the Clay Memorial Hospital in Atlanta, Georgia.* Two hundred and three, out of five hundred patients admitted to the Medical Wards of a general hospital had ophthalmoscopic abnormalities related to their medical condition. An additional group of seventy-five had changes unrelated, but significant.

To the physician, the ophthalmoscope has proven its greatest worth in the fields of cardiovascular disease, diabetes, and neurology. Its importance in the diagnosis and prognostic evaluation of hypertension is evidenced by the fact that the severity of the latter is graded according to the ophthalmoscopic findings (Keith-Wagener classification). It is, indeed, a pity that the invention of the ophthalmoscope preceded that of the sphygmomanometer. Were it not for this chronological accident, much of the confusion surrounding the term "albuminuric retinitis" would have been avoided. This misnomer, introduced in the eighteen fifties, when the frequent association of a characteristic ophthalmoscopic picture (irregular narrowing of the arteries, exudates, hemorrhages, papilledema) with albuminuria was first observed, persisted to confuse and confound long after the invention of the sphygmomanometer, when it became apparent that the ophthalmoscopic picture of "albuminuric retinitis" was a result of hypertension, whether primary or secondary, and not of renal disease per se.

It took a similarly long period of time to clarify another area of confusion in the crowded neighborhood of hypertensive disease, namely that of the arteriosclerotic fundus. Changes observed in the latter have been often ascribed to hypertension; and conversely, the characteristic abnormalities of hypertension attributed to arteriosclerosis. This confusion was not so much the result of inaccurate observation as that of lack of clarity of definition and understanding of the basic pathology of — and differences between — these conditions.

The characteristic retinal changes of Diabetes Mellitus have been described early in the history of ophthalmoscopy. Their nature, as well as their relationship to the duration and control of the diabetic condition, have often been a subject of controversy. On the whole, however, diabetic retinopathy is surounded by less confusion than her sister retinopathies.

Ophthalmoscopy occupies a prominent place in the field of Neurology. The ophthalmoscope is the earmark of the neurological consultant, his most cherished instrument. It is also a favorite with the public. While the patellar hammer is regarded by some as an instrument of torture, and the tuning fork as a source of amusement, the ophthalmoscope is respected by all. It seldom fails to establish good rapport between doctor and patient.

One of the most important early observations of fundoscopic changes in neurological conditions was made by Van Graefe in 1860, when he described the findings of choked disc in association with tumors of the brain in an article entitled: "Concerning the Complications of Optic Neuritis with Disease of the Brain". He used the term "Neuritis" because he interpreted the findings as indicative of inflammation. This marked the beginning of a somewhat confusing interchangeability of the terms optic neuritis, papillitis, choked disc, and papilledema. It took a long time before a distinction was made between the choked disc of increased intracranial pressure due to tumor, abscess, trauma, hemorrhage, etc., with its enlargement of the blind spot and relatively good central vision on the one hand, and optic neuritis due to lead poisoning or neuromyelitis optica with its early impairment of central vision, on the other. It took almost as long to clarify another important finding observed in various neurological conditions, namely that of optic atrophy, and to differentiate between the sharply delineated, porcelain - white primary optic atrophy, such as occurs in tabes dorsalis, the irregular untidy changes secondary to previous papillitis, and the temporal pallor of the disc due to retrobullar neuritis. Apparently in fundoscopy, as in many other branches of medical investigation, observation and interpretation have not always walked hand in hand, the latter often lagging for behind.

Ophthalmoscopy is also of value in the diagnosis of rare neurological conditions, such as toxoplasmic encephalitis, tuberculous meningitis, tuberous sclerosis, retinal and cerebellar angiomatosis, (Von Hippel - Lindau's disease), and the interesting group of heredo-familial retino cerebral degenerations, in which the degeneration of the white matter is associated with optic atrophy, and that of brain cells with retinitis pigmentosa and degeneration of the macula. The latter group of familial conditions, also known as the neuronal lipoidoses, include a host of "diseases" designated by the names of the men who first described them (Tay-Sachs, Niemann-Pick, Hand-Schuller-Christian, Krabbe, Scholtz and others). They all belong to the curiosities of Medicine. To the physician who happens to breathe the rarefied air of this high ground of Medicine, examination of the eye grounds may be very helpful in arriving at a diagnosis.

In addition to the conditions in which an ophthalmoscopic examination is a sine qua non, for its omission may jeopardize diagnosis, there are many others in which it is occasionally of some assistance. Suggestive changes may be present in such diverse conditions as anemias, leukemias, polycythemias, subacute bacterial endocarditis, cholesterolosis, chemical poisoning and many others.

The ophthalmoscope is truly the aristocrat of the medical instrumentarium, respected by all specialties, except perhaps those of gastro-intestinal diseases and diseases of the lungs. Experts in these fields, finding little use for fundoscopy, have to console themselves with the aggressive "nouveau riche" of endoscopy, the bronchoscope, and the gastroscope. They must indeed feel frustrated, for — useful and profitably informative as these instruments may be — they cannot match the casual elegance of the ophthalmoscope, nor can the view provided by them compare with the rich beauty of the retina, as into the full view of the beholder, floats the fundus oculi.

*Incidence and diagnostic value of Ocular Fundus Lesions in hospitalized medical patients. Curtis D. Benton, Jr., Am. J. of Med. Sciences, Nov., 1952.

Manitoba's Medical Men
XXI. Mental Retardation

The executive of the Manitoba Medical Association received the following letter from the Association for Retarded Children in Manitoba.

"The Association for Retarded Children in Manitoba is attempting to secure assistance from the Provincial and Federal Health Authorities to conduct a survey of mentally deficient and mentally retarded persons in Manitoba.

It is admitted that there are 12,000 persons in Manitoba who could be classed as Mentally retarded but the Association is desirous of knowing exactly where they may be located. This would mean having access to names and addresses in order that the Association may effectively expand its program and make it available to all ages, and to all types of mental retardation.

You can appreciate the fact that to conduct a door to door survey is impossible due to the expense involved. The association is of the opinion that, if the co-operation of the Medical Profession, Health Units, Schools, Welfare Agencies and the like, were obtained, it would be possible to complete a reasonably accurate survey.

In so far as the Medical Profession is concerned, the association had the thought that each doctor could be interviewed to obtain the names, addresses and case histories of persons who could be classed as mentally deficient or mentally retarded. Once the initial survey is completed, subsequent cases coming to the attention of the members of the Medical Profession could be reported to the Association.

If we know the names and addresses of these persons requiring assistance, we are sure that the Association's program can be helpful both to them and to their parents. We would therefore appreciate your bringing this matter to the attention of your Association with the hope that they will approve of contact being made with their individual members. If your Association so approves, it would be of valuable assistance if each member could be so advised and their individual co-operation would thus be assured."

Discussion followed as to the advisability of giving out names and it was decided that literature published by the Association for Retarded Children be given parents of such children reminding them that something can be done for the children through the Association. It was decided to publish the letter in the Review in order to encourage doctors to co-operate with them and it was further suggested that an editorial on the subject be prepared. Accordingly the director of the Child Guidance Clinic was asked to submit some of his thoughts on the matter. The following are his opinions for doctor guidance.

Extent of problem:

3% of the general population (2% of school age population) are mentally defective. They must be distinguished from an additional large number who have normal potential but may be functioning at a defective level. Diagnosis is not easy in many cases and particularly in the age group below the age of 3 years. The few who are grossly defective are usually obvious. Caution is advisable and a definite statement should not be made until the

physician is absolutely sure— remembering that diagnosis in the majority of cases is not easy and to unjustly stigmatize a child with a label of being "subnormal" after a casual examination is a serious situation.

Classification

Of the 3% of the population who are defective:
75% are "educable"
20% are "trainable"
5% are severely retarded.

The educable can be taught in special classes, often up to the grade IV level of work. This should be done in special ungraded classes of not more than 15 students. In the regular class, the child may be "segregated" socially, emotionally, intellectually and even physically from his age mates— and the chances are he is learning nothing. Being in a special class does not give the child a "complex" (with the inference that a "complex" is bad) either because he is not with "normal" children or because he will be "spoiled" by too much attention. Even if he appears "happy" now sitting in a regular class "learning to act like a student", he is learning less than he could. He will be unhappy later when he is unable to compete as well as he should in the workaday world. In the special class, every effort can be made to use every bit of potential he has in order that he can approach normal as nearly as possible. There are about 33 such special classes in greater Winnipeg. If handled at all well, the problem of the child being looked down on for being one, seldom if ever, arises. The class is referred to by the name of the teacher ("Miss So-and so's Class").

The Provincial Government since last year has allowed the same Educational Grant for a special class of 15 children as for a regular class of 30 children. With this encouragement, several suburbs of Winnipeg and various municipalities in Manitoba have set up, or are planning, such classes. These classes are not compulsory for a school district. Under section 327 of the Public Schools Act, any child who is a mental defective within the meaning of the "Mental Deficiency Act" may be prohibited from attending school. In actual practice, almost all schools try to make some provision for the educable retarded child.

The "trainable" retarded child is unable to benefit from any academic instruction but can be socialized and receive habit training in classes suited to his needs. The Association for Retarded Children in Manitoba conducts 5 such classes with 50 pupils in Old St. Andrews Church (with a waiting list of 60). There is no other provision for these children outside of the Home for Defective Persons in Portage la Prairie.

The severely retarded child is unable to care for himself even in the simplest way. Often he is completely bed-ridden.

Diagnosis

The diagnosis is based on the most careful history, development assessment and meticulous physical examination, plus any indicated laboratory, x-ray, etc. procedures. After the age of 3 (some say 2) a well trained and experienced psychologist can contribute further helpful evidence through formal testing. A "Social Quotient" obtained from a Vineland Social Maturity Scale (the test score is based on information obtained from the parent) is helpful in planning needed activities for the child. The standard intelligence tests are all used.

Interpretation to Parents

Do not give a definite diagnosis until it is as certain as possible, even if it means waiting until the child is of school age or old enough to be formally tested and demonstrate his abilities under close observation in a class-room.

Parents are ambivalent, at least, about their defective child. They cling to any straw which may alter the picture. Facing them directly with the diagnosis often drives them to snatching for more straws. They may intellectually accept the diagnosis when they cannot emotionally.

In many cases, months or years of hardship for the parent can be avoided if time is taken when the diagnosis is first made. The parents need a chance to express their feelings—their guilt over having such a child, their hopes and fears about its future, their ideas about the effect the child may have on them and their other children. They may feel duty bound to keep the child while inwardly wishing to be relieved of the burden. After they have worked through their feelings and can accept the situation with reasonable objectivity, they will be able, in most cases, to make their own decisions about such things as placement, and be quite content about it.

Many parents who have no thought but to keep the child come to the physician for possible treatment for the child, guidance in his care and information about what to expect. To suddenly inform such parents that their child ought to be in an institution or will ruin their home life, etc., may throw them into a renewed quandary from which it may take some time for them to recover. A good book for parents is "The Backward Child" a publication of the Federal Department of Health and Welfare and available to physicians and others through the Provincial Department of Health and Welfare Education (320 Sherbrook St.).

Each child then must be individually considered and it must be recognized that most of the parents have mixed feelings they must work through before they can face the issue squarely. Time and patience are necessary. The parents will appreciate and be impressed by the care of the physician in making the diagnosis and the time he gives them to unburden their feelings and

ideas. They may appear "stupid" to the physician but it is a serious matter to them.

Institutional Care

Particularly up to school age, the child, even though defective, needs the security, affection and acceptance of a good home unless he is to become an emotional problem as well as intellectually handicapped. An institution cannot reproduce this home atmosphere. There will always be resistance to admitting to institutions, children under the age of 6, although it will be recognized that there is a group who cannot be barred. They are the ones who must be placed because of parental incompetency or illness, broken homes, because the mother is unmarried, etc. In most cases, even gross physical handicaps should be managed at home.

Information for Physician

It behooves the physician to acquaint himself with the legal provisions for the care and protection of mentally defective persons contained in the relevant provincial acts. Before relating to parents the possibilities of care for the child, he should refer to the Provincial Psychiatrist for the current government policy in regard to admissions and the likelihood of admission for the particular case. He may advise to have the child examined and certified. Such an examination may be done in the OPD of the Provincial Hospitals at Brandon and Selkirk, the School for Defective Persons at Portage la Prairie, or the Psychopathic Hospital in Winnipeg. The government facilities for care of defective persons can be explained to the family at the time of the examination. The facilities at Portage are now very good and there is an active expansion program under way to make them the very best anywhere. Physicians will find the World Health Organization Technical Report series No. 75 "The Mentally Subnormal Child" very helpful and informative.

Association for Retarded Children in Manitoba.

An outgrowth of a group formed by parents with children in the School for Defectives at Portage. They now encourage parents of any defective child to join and welcome other interested persons. They are motivated by a feeling that in some areas of the problem, the defective persons are being neglected. They are working to define these areas (e.g. pre-primary classes for the educable retarded, sheltered workshops, counselling for teenage defectives, home visitors to assist parents in caring for defective children, etc.) and have set up an experimental project (the classes for trainable retarded children at Old St. Andrews) to demonstrate what can be done. They are trying to get financial support from the government to continue projects that prove their value. At first they were very suspicious of professional persons and felt they did not have the real interests of these children at heart. Largely, I think, through the help given by the Child Guidance Clinic in the conduct of their special classes, they now have come a long way in seeing the reasons behind stands that have been taken in regard to their children by physicians, teachers and others in the past. They have recently elected the Head of the Child Guidance Clinic Psychology Department to their Board of Directors. I think she will do a tremendous amount to further develop their confidence. In the past few months they have been seeking medical and other professional guidance far more than ever before. The care of physicians in handling defective children is essential to expanding this confidence.

The Association holds regular meetings to which speakers are invited to inform them and discuss their problems. The members are encouraged to share their problems with each other to relieve their feelings and become more objective. The Association also provides gifts, parties, etc. for the inmates at Portage.

Another authority has summed up the problem as follows:

"The doctor's chief aim is to encourage the parents to adapt themselves to the child's handicap, and the child to make the most of his resources".

L. A. Sigurdson, M.D.

Letter to The Editor

Dear Editor:

While so much is heard today about contrived public relations for physicians, we should not, I think, overlook the important though unobtrusive role played by so many of our physicians, at least through M.M.S., in holding high the standards of the past in all their relations with the public.

This may be illustrated by even a casual glance at the enclosed letters addressed to M.M.S. by subscribers. These letters are exactly as written to us with the exception of the deletion of names of physicians, names of subscribers and residence. They are in reply to M.M.S. notices of claims paid and are based on a scattered sampling of beneficiaries every month.

I am enclosing the originals of these appreciative comments, which we receive daily in the mail, for your personal verification of the typed copy submitted for publication.

Yours sincerely,

Dr. J. C. MacMaster,
Executive Director,
Manitoba Medical Service.

Editor's note:

The following are a few excerpts from the fifty odd letters sent to us by Dr. MacMaster:

"Delighted and very well pleased with both Doctors and Interns.

When I first saw Dr. ..... I was in poor shape, I took one look and the thought struck me, 'They have placed me in care of Jack Dempsey, I'm sunk. This fellow will surely double me up and try to shove my left knee in my right ear.'

Then I learned something. He was gentle, kind and understanding as man could possibly be. I have the very highest regard for him as a Doctor and a Gentleman. The Manitoba Medical Service surely treated me right and in return I'm a real "Booster"."

"I wish to thank you very much for the splendid and wonderful service rendered by your member doctors, particularly Doctors ....., to mention but a few. They certainly fulfilled, and then some, their part of the services."

"Many thanks for your letter of Sept. 22nd. Please accept my sincere thanks for the excellent kindness and attention afforded me. We, in Winnipeg, are fortunate to have such an aggregation of brilliant medical men who are second to none—including the famous Mayo Clinic and such.

There are no comments or suggestions, that I could give, which would improve the already high standard of the Manitoba Medical Service. You are doing a very commendable work. Manitoba Medical Service is all, and more, than could be desired."

"Your letter of Aug. 31 received some time ago, I should have replied sooner.

I really have no suggestions to put forward. I would like you to know that I am very satisfied with the M.M.S. and also with the treatment while in hospital and also with the first-class attention from the doctors. As far as I am concerned I don't think there is any room for improvement. You people are doing a wonderful job."

"I want to tell you my experience with M.M.S. has been completely satisfactory and I would never be without the protection it offers a working man and his family. I want to thank you and all the Doctors affiliated with the service for the good they are doing."

Letter to the M.M.A.

Cardiac Registry and the School Health Program

Dr. M. T. Macfarland,
Executive Secretary,
Manitoba Medical Association,
Dear Doctor Macfarland:

A survey of Winnipeg Public Schools conducted in 1953 and 1954 revealed that of 453 school children reported to have heart disease, 234 were considered to be normal after examination and review of school physician and private physician reports. This is in line with the results of surveys conducted in Toronto and Metropolitan New York where about 50% of murmurs noted in school children were finally regarded as functional and likely non-significant.

The present status of cardiac disease in the Winnipeg public schools is as follows: (as of October, 1954).

Total school population	35,700
Rheumatic Heart Disease	36
Congenital Heart Disease	86
Doubtful Heart Disease	72

The diagnosis of the **Rheumatic Carditis** group was established after review of medical records, correspondence with private physicians and examination by school physician. The incidence is among the lowest on the continent, (1 per 1000). It is necessary in this group to establish the amount of physical activity permitted within the framework of the school system. In some cases, marked restriction of activity has been carried forward from year to year without reassessing the child's status. Possibly a third of this group have an inactive carditis and would likely be better on full activity. A few might be benefited by more restriction. The desirability of continuous prophylaxis in this group is recognized by physicians specially interested in the problem, but has not been generally applied by the medical profession. Finally, the group of "doubtful" heart disease may contain some hitherto undiscovered cases of Rheumatic Carditis. These should be correctly labelled and then placed on adequate regimen of prophylaxis and school activity.

The **Congenital Heart** group at present out numbers the Rheumatic group two to one. Again this corresponds exactly with Toronto and New York surveys. About one fourth have a definite diagnosis established by the private physician or hospital clinic. Eight cases have undergone surgical treatment within the last two years; some of them as the result of the school survey. It is important to establish the diagnosis as accurately as possible for the sake of those children who might benefit by cardiac surgery now or in the near future. Investigation by X-ray, electrocardiograph and in some instances by angiographs and cardiac catheterization may be referred for this purpose. In the New York study the tentative diagnosis in this group was changed in 36% of the cases following careful investigation as outlined above (Journal of Paediatrics, September, 1954, M.273). Many children in this group are at present on restriction of activity because of the presence of a cardiac murmur. It is my impression that this restriction is not justified in many cases but I

would hesitate to alter their status without further information not now available.

The **"Doubtful" Cardiac Disease** group comprises an undiagnosed residue consisting of children with normal, congenital or rheumatic hearts. Correct labelling and treatment is not possible without further study.

The Department of Health of the City of Winnipeg has received a Dominion - Provincial Health Grant effective April, 1955 for one year to carry out the investigative procedures outlined above. This study will be carried out through the University of Manitoba Medical School and will involve the Departments of Paediatrics, Surgery and Radiology.

The funds provided by the grant will make possible the examination by a cardiologist, electrocardiography and X-ray without expense to the patient. **Written permission of the private physician will be required in every case.** Cases presenting serious diagnostic problems after these studies are completed will be reviewed by the Cardiac Group Clinic, the chairman of which is Professor C. C. Ferguson. Information obtained and recommendations will be sent to the Private physician, who may then inform the patient of the findings and suggest treatment if any.

The purposes of this study are:

(1) To arrive at an accurate cardiac diagnosis in as many cases as possible.

(2) Where no cardiac disease exists, to remove the label of potential heart disease from the child

(3) To ensure that children with Rheumatic Heart Disease be given the benefit of prophylactic care to prevent recurrence of carditis.

(4) To restore to full activity those children who have inactive carditis and good cardiac reserve.

(5) To determine the number of children with Congenital Heart Disease who might be benefited by cardiac surgery.

(6) To establish a cardiac registry.

The co-operation of your society is requested in helping to carry this study through successfully.

I am enclosing a copy of the instructions issued to school Physicians in regard to cardiac findings and also the questionnaire we now employ.

Harry Medovy,
Chairman, Dept. of Paediatrics,
University of Manitoba.

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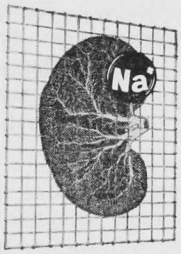

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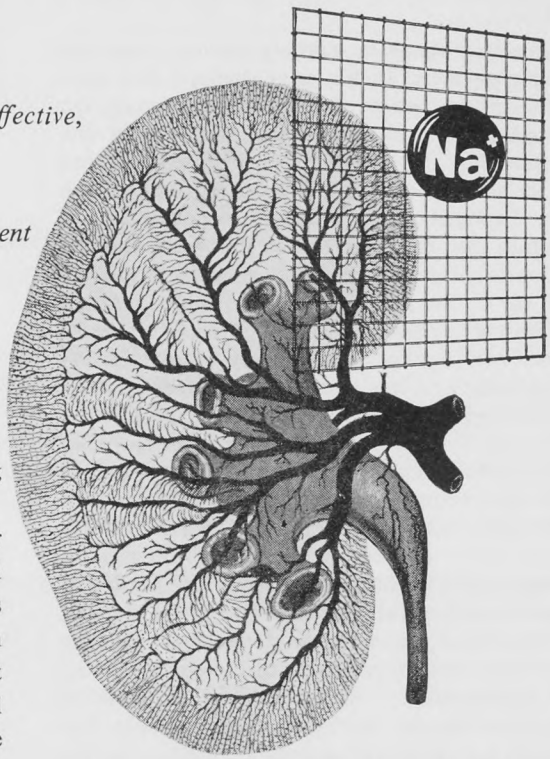

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Dr. Digby Wheeler — *An Appreciation*

On September 20th, 1955 there died a man known widely and favorably not only in Winnipeg and Manitoba but throughout Canada and far beyond its boundaries. On that day sometime in the early morning hours, on the train in which he and his wife were returning from a somewhat hurried but very happy visit to Eastern centres, Digby Wheeler quietly dropped the threads that bound him to life.

At this time there is scarcely need to mention the successive steps in his development and education for his chosen profession. His preparation was thorough and in it he very wisely laid the foundations for the wide cultural interests that figured so prominently in his later life and which not only brought great pleasure to himself but also led him into many activities that were helpful and pleasurable to others.

In so far as his professional life was concerned he steadfastly pursued a course directed toward one objective—increased proficiency in radiology—both diagnostic and therapeutic. One after another he met the requirements demanded by practically all the qualifying bodies relating to the specialty in the Anglo-Saxon world. Attendance at relevant scientific gatherings and visits to centres where valuable new work was going on, furthered his objective. In a number of hospitals he put his knowledge and experience to work in the planning, organization and operation of radiological departments. In these departments there was striving for the closest collaboration with colleagues in all clinical departments. Almost from the time of graduation he taught in the Medical School—first in anatomy and later in his own specialty. In the hospitals with which he was connected, teaching of a less formal type went on. There was nothing perfunctory or dry as dust in these instructional periods. Extreme practicality lightened by whimsical wit and humour characterized them.

The corporate interests of Medicine claimed his interest and efforts. Medical societies, hospital programmes for development and organization, the Manitoba and Trans-Canada Medical Services, the Medical Arts Building, all benefited from his wisdom, experience and energy.

But medical and related fields by no means claimed his entire attention. He was a discriminating reader and while no doubt the primary recompense for this was his own enjoyment, it inevitably broadened and enriched his knowledge and did much to add to the facility in speaking that was a valuable asset in his many and varied activities.

Music was always a source of pleasure and solace to him. In it he was no dilettante. His knowledge of composers and their works was extensive and nothing pleased him more than to invite appreciative friends to listen to selections from his very large record library. These occasions were for quiet listening and desultory talk was not welcome. When the experiment of arranging weekly concerts of fine recordings for medical students was tried, he was a most enthusiastic participant.

From the time of its organization, the Symphony Orchestra claimed his interest. Not satisfied with being a listener he worked steadily in its support and for its welfare. During the years of his presidency it is probable that more was done to interest the community in its orchestra than ever before.

He was a most sociable person and as guest or host he could be depended upon to contribute to everyone's enjoyment, in his inimitable, spontaneous fashion. His propensity for things a bit out of the ordinary—whether in clothes or motor cars led some to think of him as something of an exhibitionist. While some small element of this sort of thing may have played a part in leading him to display at times of the unusual, one is quite certain that he deliberately planned many of these attention-attracting things. He did not object—in fact he seemed to enjoy — good-natured and, at times, not-so-good natured raillery directed at himself. He was quite capable of holding his own at such times.

"A spirit intense and rare with trace on trace
Of passion and impudence and energy
. . .
A deal of Ariel, just a streak of Puck
Much Antony . . .
And something of the Shorter Catechist."

As a friend, he was sincere, kind and generous, never failing to respond when opportunity presented itself and often enough seeking out those whom he believed he could help. No one will ever know the number of those who were the recipients of the kind thoughtfulness of Mrs. Wheeler and himself. A veritable cloud of witnesses could and would testify to the goodness that came to them from that home. It is neither a large nor pretentious home but sufficient, resting in a setting that was the pride and joy of its possessors.

"A garden is a lovesome thing, God wot
Rose plot,
Fringed pool,
Ferned grot,
The veriest school of peace."

His flowers, shrubs and lawns, the object of his tender solicitude, were in truth both a haven

of peace for himself and a thing of beauty to be shared freely with friends.

One may view with concern the seemingly inevitable tendency in modern society to discourage individuality and overvalue uniformity and conformity. The net result all too often is the production of monotonous mediocrity. Nowadays there seem to be few counterparts of the strong and noteworthy personalities of the not too remote past. Digby had about him a certain unmistakeable uniqueness. His was no life of resigned acceptance of things as they are. Being a bit different concerned him little. He enjoyed it. And this along with his many other characteristics will insure him a place in the respectful and affectionate remembrance of those who knew him.

One does not know of intimations he may have had that life would not be long and its termination sudden. If he had such, he kept them to himself and pursued his usual life unmindful of or disregarding them. One can believe that even with his zest for life and his intense interest and enjoyment of so many things, he would not have had the inevitable, when it came, different from what it was.

Perhaps in final dreams, he walked in his garden proud and happy in its loveliness; perhaps majestic and triumphant music lulled him; perhaps he thought of those he loved and who loved him. No one will know but there are none but would hope that such things might have been.

A. T. Mathers.

Obituary

Dr. Joseph Laurie Lamont

Dr. Joseph Laurie Lamont, 64, died on Sept. 25 in the Winnipeg General Hospital. Born at Treherne, where his father Dr. T. J. Lamont practised for many years, he was educated there, then graduated in science from the University of Manitoba in 1911, and in medicine from Edinburgh University in 1917 with honors.

After graduation he joined the Royal Navy as a medical officer serving until the conclusion of the First World War. He then returned to Treherne to practise medicine, until the outbreak of the Second World War when he joined the R.C.A.F. and was stationed for a time at Halifax.

In 1941 he returned to Winnipeg to become district medical officer in the Department of Veterans' Affairs. He retired in December 1948 because of ill health.

He is survived by his wife, one son Dr. Thomas Lamont now practicing at Tilsonburg, Ont., and three sisters. He was buried in Treherne cemetery.

Dr. Thomas Digby Wheeler

The medical profession suffered the loss of a prominent and well liked member in the sudden death of Dr. T. Digby Wheeler, F.R.C.S. (C), F.A.C.S., who died of coronary occlusion suddenly on a train returning from Philadelphia, where he had been made a Fellow of the American College of Surgeons. He was 63 years of age at the time of his death.

Dr. Wheeler graduated in Arts from the University of Toronto and in Medicine from University of Manitoba in 1916, after which he took a year of postgraduate study in London before joining the Canadian Army Medical Corps in the First World War. After returning from army service he practiced for some time in St. James and has continued to reside there ever since. Later he specialized in Radiology, at first being associated with Dr. Currie McMillan, and then opened his own office which has expanded to a large Radiology clinic.

Dr. Wheeler was past president of the Winnipeg Medical Society and the Canadian Society of Radiologists and did a great deal to forward the interests of radiologists throughout Canada. He was prominent in developing and perfecting the planigraph which added a third dimension to X-Ray films and greatly assisted diagnosis.

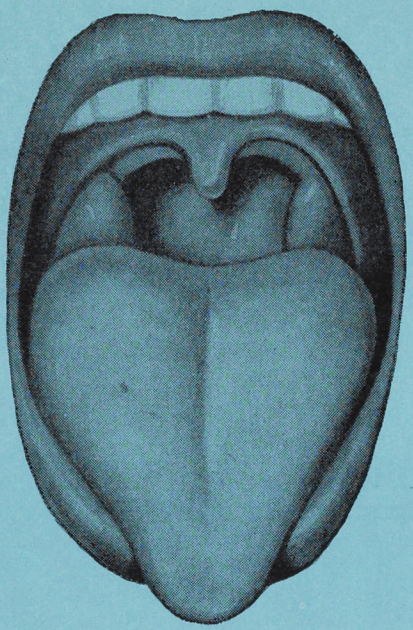
He has been very active in teaching and assisting young radiologists, many of whom owe their start in this important specialty to his help and advice. At the time of his death he was chief radiologist in several hospitals including St. Boniface, Misericordia, Grace, Victoria and Shriners Hospital for Crippled Children, and was chief consultant in Radiology at Deer Lodge Hospital, and head of the Manitoba X-Ray Clinic.

Dr. Wheeler was a prominent patron of music in Winnipeg and has been president of the Winnipeg Symphony Orchestra. He was also a great lover of flowers, and his gardens at his home on Portage Avenue in St. James have always been delightful and won frequent awards.

Soon after graduation he married Eleanor Mitchell who survives him and who is prominent in women's church and service circles in Winnipeg.

The medical profession as a whole has suffered a real loss in the death of this capable physician.

T. H. W.



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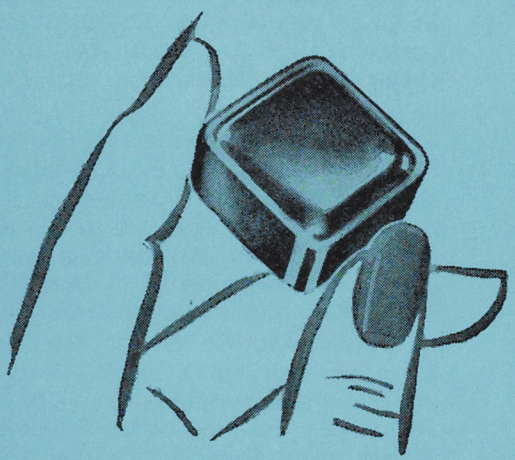

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The Fargo Meeting of the Minnesota-Dakota-Manitoba Orthopedic Society

According to the proverb, it is always fair weather when good fellows get together, and the weather in Fargo was definitely fine on 9th and 10th September, 1955.

The Minnesota-Dakota Orthopedic Society was launched a number of years ago, and in 1950, Manitoba was invited to join with these States in forming the Minnesota-Dakota-Manitoba Orthopedic Society, known shortly as "Mindaman." Since then the members have foregathered once each year, in the early days of September. There are some 70 members, of whom 13 are from this Province. Since 1950, the meetings have been held in Duluth, Winnipeg, Rochester, Minneapolis, and this year, the members assembled at Fargo. When the Society visited Winnipeg in 1952, a very happy gathering was held at Lower Fort Garry. That evening is still referred to in glowing terms by those who had the good fortune to be present. The duty of preparing the programme devolves on the members of the State or Province in which the meeting is held. In this year of 1955, North and South Dakota between them arranged the professional presentation, while the members who practise in the city of Fargo made themselves responsible for the local arrangements, including manifestations of hospitality. American hospitality is everywhere notable, and in the Middle West, it probably reaches its zenith.

The programme presented occupied the afternoon of Friday, the 9th, and the forenoon of Saturday, the 10th. It was a long programme, and indicated the high level of the work being accomplished both in North and South Dakota.

It is not possible to give more than the titles of the cases and subjects discussed.

9th September:

Dr. F.: a) Intermittent Paralysis associated with faulty potassium metabolism.

b) Scoliosis, diagnosed as disc; spine fusion; secondary growth in the donor site. Neuroblastoma.

c) Tumor of upper end of humerus; microscopic diagnosis, Ewing, reticulo-celled sarcoma, Hodgkin. Tumour cleared up; boy is well. Moral?

Dr. C.: Avascular Necrosis; Factors influencing the growth of bone.

Dr. L.: Fatigue Fractures; Examples from metatarsals. Pelvis, femur, tibia, Os calcis.

Dr. S.: Epiphyseal stapling. Method and timing.

Dr. C.: a) Ununited fracture of tibia in boy; graft from an uncle; result excellent.

b) Tumor of foot; rhabdomyosarcoma; lived 5 months.

c) Tumor of clavicle; infantile thyroid tissue.

d) Tumor of radius; erosion of biceps tendon.

e) Car accident; fragment from medial condyle of femur embedded in muscle on medial side of thigh.

f) Femur, fracture; Kuntscher nail proposed; no medullary canal.

g) Dislocation of sacro-iliac joint.

h) Sclerosis of pelvis, extreme; carcinoma of prostate.

i) Bilateral fracture of scapula.

Dr. H.: a) Osteoid Osteoma; tibia, neck of humerus, upper third of humerus.

b) Cong. Dis. Hip, female 33, Colonna operation with vitallium cup.

c) Judet prosthesis; migration of the head.

d) Fracture of neck of femur; use of prosthesis with extension collar.

e) Fracture-dislocation of talus; fixation with screw; later aseptic necrosis, some re-vitalisation, function fairly good in spite of this.

f) Supposed disc; found to be tumor; reticulocell or Hodgkin. Death.

g) Male, with pain in right testis; diagnosed as disc; arachnoid cyst.

h) Fracture-dislocation Lumbar, 1-2. Paraplegia, incomplete; open reduction, fixation; recovery; now working as cowboy. Photo.

i) Car accident Dislocation of C4 on C5; immediate quadriplegia; Skull traction 6 weeks; recovery complete.

10th September:

The first paper was given by a neuro-surgeon, (Dr. C.) on the subject of management of fracture-dislocation of the neck by co-operation between the neuro- and the orthopedic surgeon.

Dr. J.: Osteo-chonditis dissecans of the knee-joint.

Dr. V. a) Closed reduction of congenital Dislocation of the Hip-Joint.

b) Aseptic Necrosis of the head of the femur.

Dr. S.: Aseptic Necrosis of the femoral head in Cong. Dis. of the hip.

Dr. A.: a) Tuberculosis Dactylitis.

b) Low-grade infection of hip-joint; thought to be tuberculous; lab. work normal; exploration refused; spontaneous healing; hip now normal.

c) Gunshot wound of thigh with compound comminuted fracture of femur; stormy treatment and convalescence; 18 pints of blood. End-result satisfactory.

Dr. G.: Complications of disc surgery; injury to major vessels; infection.

Dr. V.: Chondro-blastoma of upper end of tibia; upper end of humerus, not malignant.

Dr. V.: a) Musculo-spiral paralysis; triple transplant.

b) Tumor of palm; osteoma of soft tissue.

(Continued on Page 607)

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Comparisons Communicable Diseases — Manitoba (Whites and Indians)

DISEASES	1955		1954		Total	
	Aug. 14 to Sept. 10,'55	July 17 to Aug. 13,'55	Aug. 8 to Sept. 14,'54	July 11 to Aug. 7,'54	Jan. 1 to Sept. 10,'55	Jan. 1 to Sept. 4,'54
Anterior Poliomyelitis	10	6	14	42	21	106
Chickenpox	13	37	49	49	891	1287
Diphtheria	0	0	0	0	1	0
Diarrhoea and Enteritis, under 1 year	23	17	9	17	70	129
Diphtheria Carriers	0	0	0	0	2	0
Dysentery—Amoebic	0	0	0	0	0	0
Dysentery—Bacillary	0	2	2	3	8	19
Dysentery—Bacillary Carrier	0	0	0	0	0	1
Erysipelas	2	0	3	1	9	22
Encephalitis	0	0	3	1	0	4
Influenza	22	28	6	4	196	76
Measles	25	54	63	40	2045	834
Measles—German	4	0	0	2	62	14
Meningococcal Meningitis	1	1	2	1	12	16
Mumps	24	47	28	28	912	923
Ophthalmia Neonatorum	0	0	0	0	1	0
Puerperal Fever	0	0	0	0	0	0
Scarlet Fever	5	7	6	18	129	401
Septic Sore Throat	1	3	4	1	17	44
Smallpox	0	0	0	0	0	0
Tetanus	0	0	0	2	0	2
Trachoma	0	0	0	0	0	0
Tuberculosis	68	57	83	83	400	594
Typhoid Fever	0	0	0	0	1	3
Typhoid Paratyphoid	0	0	0	0	0	0
Typhoid Carriers	0	0	0	0	0	0
Undulant Fever	1	0	0	0	6	7
Whooping Cough	60	38	35	7	519	84
Gonorrhoea	137	97	113	123	667	921
Syphilis	7	4	11	7	67	75
Jaundice Infectious	25	24	22	11	223	268
Tularemia	0	0	0	0	2	2

Four-Week Period August 14th to September 10th, 1955

DISEASES (White Cases Only)	*828,000 Manitoba	*861,000 Saskatchewan	*2,825,000 Ontario	*2,952,000 Minnesota
*Approximate population.				
Anterior Poliomyelitis	10	27	42	208
Chickenpox	13	5	106	....
Diarrhoea and Enteritis, under 1 year	23	22	....	....
Diphtheria	....	....	....	6
Diphtheria Carriers	....	....	....	....
Dysentery—Amoebic	....	....	....	3
Dysentery—Bacillary	....	....	19	11
Encephalitis Epidemica	....	3	3	....
Erysipelas	2	....	1	....
Influenza	22	....	21	6
Jaundice, Infectious	25	39	41	77
Measles	25	....	213	14
German Measles	4	....	87	....
Meningitis Meningococcal	1	1	5	3
Mumps	24	1	306	....
Ophthal. Neonat.	....	....	....	....
Puerperal Fever	....	....	....	....
Scarlet Fever	5	5	31	9
Septic Sore Throat	1	5	12	32
Smallpox	....	....	....	....
Tetanus	....	....	....	....
Trachoma	....	....	....	....
Trichinosis	....	....	....	....
Tuberculosis	68	43	72	79
Typhoid Fever	....	9	5	....
Typh. Para Typhoid	....	2	....	....
Typhoid Carrier	....	....	....	....
Undulant Fever	1	2	6	7
Whooping Cough	60	73	259	18
Gonorrhoea	137	....	75	....
Syphilis	7	....	16	....

DEATHS FROM REPORTABLE DISEASES
September, 1955

Urban—Cancer, 44; Pneumonia, Lobar (490), 3; Pneumonia (other forms), 8; Syphilis, 1; Tuberculosis, 3; Food Poisoning, 1; Septicaemia and Pyaemia, 1; Jaundice, 1. Other deaths under 1 year, 17. Other deaths over 1 year, 174. Stillbirths, 8. Total, 261.

Rural—Cancer, 39; Influenza, 2; Pneumonia, Lobar (490), 2; Pneumonia (other forms), 13; Tuberculosis, 3; Diarrhoea and Enteritis, 8. Other deaths under 1 year, 11. Other deaths over 1 year, 183. Stillbirths, 8. Total, 269.

Indians—Cancer, 1; Diarrhoea and Enteritis, 5. Other deaths under 1 year, 1. Other deaths over 1 year, 7. Stillbirths, 2. Total, 16.

◆

Anterior Poliomyelitis — At date of writing, October 3rd, only twenty-five cases have been reported in 1955 and less than half of these show any paralysis.

Typhoid Fever — In our next report we will have some information re one case in Winnipeg and at least four in one family in rural Manitoba. No connection between the two infections.

Whooping Cough shows a marked increase over 1954 but even so is not far from an average incidence. Immunization of young children must be kept up.

Venereal Diseases show some decrease but we have had an occasional case of primary lues reported which is always significant and discouraging.

Now Is The Time To Have Your Vision Checked!

STOP Battling those baffling, aging eyes that no longer give you sure, sharp, strain-free vision.

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Winnipeg

(GUILD) OPHTHALMIC DISPENSERS . . .

Lipo-Geritaine

LIQUID

In all conditions where a specific LIPOTROPIC treatment is indicated

FORMULA

Each tablespoonful contains:

Betaine	200 mg.
Choline	15 mg.
Liver Ext. (Fraction 1)	15 mg.
Vitamin B_{12} (amorphous)	1 mcg.
Methionine	10 mg.

INDICATIONS

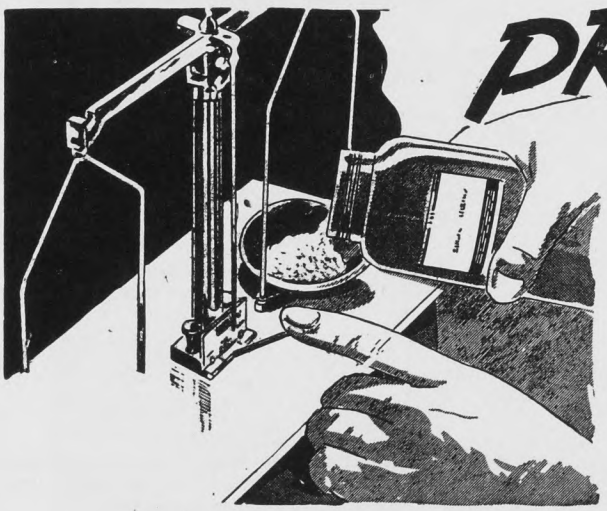
Coronary and aortic atherosclerosis, nephrosclerosis, chronic alcoholism, high blood cholesterol, diabetes, hepatitis, hypertension and the organic decline which accompanies old age and undernutrition.

POSOLOGY

One tablespoonful three times daily as directed by the physician

Anglo-French Drug Co. Ltd., Montreal

PRECISION!



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All prescriptions are compounded and filled accurately and scientifically by fully qualified pharmaceutical chemists. Each prescription is then double checked for the patient's protection.

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The Fargo Meeting (Cont.)

c) Tendon grafts for flexor tendons 6 weeks after injury.

d) Syndactyly; when to operate.

e) Lost extensor of index; transplant.

f) Flexed adducted thumb; F.L.P. fibrosed. Removed; replaced with ring finger, F.S.D.; some improvement.

g) Keloid scar at elbow; skin graft followed by X-ray.

h) Hand in wringer; denuded; full thickness skin graft.

i) Opponens paralysis; polio; tendon transplant.

j) X-ray burn of hand; later, squamous-cell Ca. Excision; recurrence.

k) E.C.D. 3 and 4 divided; skin and tendon grafts.

l) Dupuytren contraction. 15 years; multiple division of fascia; improved.

m) Gangrene of finger-tip; caught in door; resutured. Healing.

n) Pedicle skin graft; sensation defective.

o) Wound at base of thenar eminence at age of 17 months; seen at age of 7 years; Tendon transplant; improved.

p) Fracture-dislocation of ankle.

q) Tear of tibial collateral ligament at knee; re-attached with staples.

r) Multiple loose bodies in knee; synovectomy.

s) Fracture-dislocation L2 on L3. Open reduction; spinous processes wired. Complete recovery of function.

It is evident that the orthopedic fare provided was rich in quality and almost embarrassingly abundant in quantity. Careful preparation was the reason that it was possible to offer so much in so little time.

Comment:

The main flow of cultural intercourse in Canada is east and west. In most areas there is a good deal of north and south exchange. This is to be highly commended. There is always something to be learned from others especially when they work in conditions a little different from those to which we are accustomed, and have been trained in other schools. Perhaps the middle-aged and senior specialists get most out of them. "Home-keeping youths have ever homely wits" and it is not to youth alone that the epigram applies. It is suggested that wherever possible, a similar group to that which has been described should be formed by the specialist groups of this province; individual visits to our fellow-workers across the border are frequent and rewarding, but more is to be gained when an organized group pays the visit. Like the quality of mercy it is twice blessed; it blesses him that gives and him that takes.

Practice For Sale

Would you like to practice in Southern Ontario where the winter is short? Eight months' net earnings buys a very attractive modern medical building (40 x 40 feet) and contents including all equipment and x-ray machine, and a very lucrative practice established for many years. Located on the main lakeshore highway between Kingston and Toronto, with excellent schools, attractive homes, farming and some industry. Only 1½ hours' drive to two medical schools where regular refresher courses are held. Nine miles from open hospital. Can be operated by two partners, or one owner and assistant. Present owners are specializing and will stay to introduce. Sale price $26,000.00; down payment $12,000.00.

Please do not phone or telegraph, but write to Dr. W. W. Wilson, Box 508, Brighton, Ont.

THE UNIVERSITY OF MANITOBA

POST GRADUATE COURSE IN SURGERY

The Department of Surgery of the University of Manitoba offers a four year course in Surgery for those wishing to take post graduate education in Surgery in preparation for the Surgical Fellowship examinations.

The course will consist of a series of graded resident appointments in Surgery and its related specialties at the four teaching hospitals affiliated with The University. These hospitals are:

THE WINNIPEG GENERAL HOSPITAL
ST. BONIFACE HOSPITAL
THE CHILDREN'S HOSPITAL
DEER LODGE VETERANS HOSPITAL

One year of the four years of the course is to be spent either in surgical research, in a related basic science, or travel. For those interested in obtaining a M.Sc. degree, opportunity will be given for them to register in the Faculty of Graduate Studies and Research at the University prior to their year in research.

A series of evening supplemental lectures and seminars will be given weekly throughout each academic year.

Specialized training will be offered to those particularly interested in Orthopedic or Urological Surgery.

Annual Fee

Nominal (approx. $25.00) (except for Research year for M.Sc. degree, when University of Manitoba, Faculty of Graduate Studies and Research fees must be paid).

Commencement of Course

July 1st, 1956

Final Date for Submission of Applications

December 1st, 1955

For application forms or further information, address:

THE DEPARTMENT OF SURGERY
UNIVERSITY OF MANITOBA
Medical Buildings
Emily & Bannatyne Sts.
Winnipeg 3, Manitoba

THE UNIVERSITY OF MANITOBA

POST GRADUATE COURSE IN ANAESTHESIA

The Department of Anaesthesia, University of Manitoba, offers a course in Anaesthesia for those wishing to take post-graduate work in the specialty in preparation for the Royal College Examinations.

Graded resident training will be provided at the four teaching hospitals affiliated with the University. These hospitals are:

THE WINNIPEG GENERAL HOSPITAL
ST. BONIFACE HOSPITAL
THE CHILDREN'S HOSPITAL
DEER LODGE VETERANS HOSPITAL

Lectures and seminars in Anaesthesia, and related subjects will be given. The students will also attend the general lectures given for all post-graduate students in the Department of Surgery, University of Manitoba.

Periods of time for training and work in related basic sciences, anaesthesia research, or travel will be arranged according to the student's wish.

Annual Fee

Nominal (approximately $25.00)

Commencement of Course

July 1st, 1956

Final Date for Submission of Applications

December 1st, 1955

For application forms or further information, address:

THE DEPARTMENT OF ANAESTHESIA
UNIVERSITY OF MANITOBA
Medical Buildings
Emily & Bannatyne Sts.
Winnipeg 3, Manitoba